



**U. S.
NAVY**

Medicine



APRIL 1971

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The issuance of this publication approved in accordance with NAVEXOS P-35.

NAVMED P-5088

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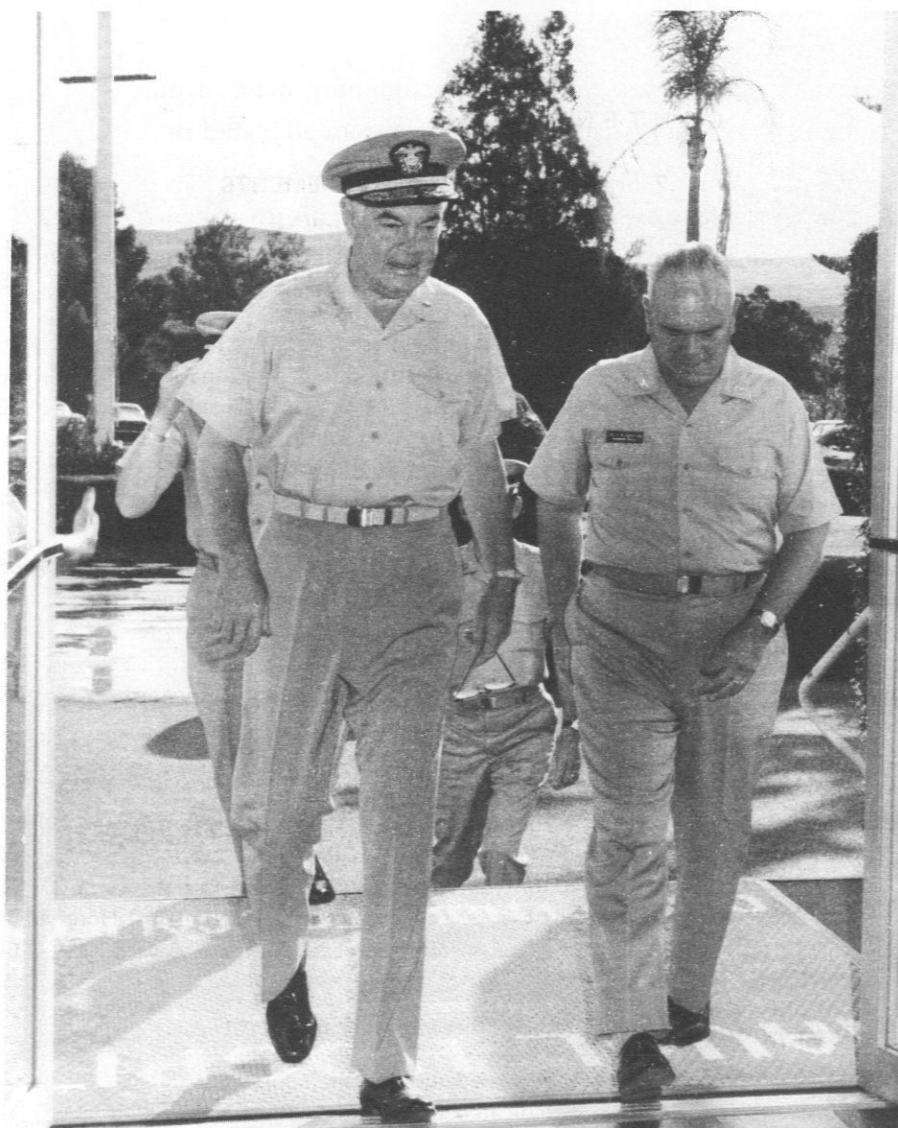
Credits: All pictures are Official U.S. Navy Photographs unless otherwise indicated.

Front Cover photograph of USS Sanctuary (AH-17) was provided through the courtesy of HMC R.M. Johnsen, USN, Code 49, BUMED. This issue is dedicated to SANCTUARY. Her Naval Hospital staff provided excellent input on short notice, in a manner characteristic of the outstanding performance of SANCTUARY in the South China Sea since 10 April 1967.

Back Cover photo was taken at the gala 100th Anniversary Ball of the Navy Medical Corps, held on 5 March 1971 in Washington, D.C. VADM G.M. Davis, Surgeon General of the Navy (left), presented the first piece of birthday cake to the area's junior medical officer on active duty, LT Loren Busselburg, MC, USNR (center). RADM J.W. Albrittain, the Deputy Surgeon General (right), was Master of Ceremonies for the evening festivities.—PAO, BUMED.

Page 2. VADM George M. Davis, MC, USN, Surgeon General, (left) is pictured during a previous visit, entering Naval Hospital Camp Pendleton, Calif., with CAPT George M. Ricketson, MC, USN, Commanding Officer (right). U.S. Navy Photo by HM1 M.R. Villaroman, Jr. Our thanks to THE PULSE BEAT, the fine monthly publication of NavHosp Camp Pendleton, for providing this picture.

Our appreciation is expressed to CAPT Elgin C. Cowart, Jr., MC, USN, Commanding Officer of Naval Hospital in USS Sanctuary (AH-17), and to his splendid staff members, present and former, who responded so generously to our urgent request for input. Space limitations unfortunately preclude a complete listing of the officers concerned, but we hope this SANCTUARY ISSUE will in some measure reward their effort. Godspeed!



from the Chief

Speaking of personal services, over many years I have often heard that Navy policy states that our dependents rate services only on an "as available" or secondary basis. This attitude is most likely to exist in exchanges, medical facilities and other support agencies. The feeling is that the primary mission is to take care of the active duty member and, if time or space remains, then his dependents.

Certainly from the standpoint of priorities the active duty member should be given first priority and returned to his work as expeditiously

as possible. Also, unfortunately from the medical standpoint, most of our manpower and facilities reflect this attitude since most were allocated or constructed with only the active duty members' needs in mind. Consequently, our provision of satisfactory and sufficient health care to active duty personnel is rarely questioned.

The challenge and need comes in providing for our dependents. The attitude that this should be done on an "as available" or secondary basis must be dispelled. Title 10, United States Code, Section 107(a), clearly states that: "A dependent of a member of a uniformed service who is on active duty for a period of more than 30 days, or of such a member who died while on that duty, is entitled, upon request, to . . . (medical care)." Our dependents have the right, not privilege, but right, to the full use of our medical facilities.

The provisions of Champus indicate Congressional interest and desire to see that our dependents do receive full support. Unfortunately the election of Champus benefits is more costly to both the service member, and to the service, than if our own facilities provide the care. Thus, any saving we can produce in this area increases fiscal resources for use in our own health care delivery systems. It is my hope that we can do everything possible to eliminate the attitude that dependents rate only "what's left over" type service. I shall do my utmost to provide the facilities and manpower to help you instill this correct concept, namely, "The Navy does care for and about its dependents!"



PROUDLY WE HAIL

Following her arrival in DaNang Harbor, South Vietnam, on 10 April 1967, USS Sanctuary continued to steam along the South Vietnam coast from DaNang to Chu Lai and off the Demilitarized Zone (DMZ), to provide medical support for fleet amphibious operations and to serve as a casualty receiving ship for Marines fighting near and in the DMZ. SANCTUARY received WIA casualties directly from the field, sick and wounded who had received prior treatment at shore medical facilities, and sick and wounded that required special treatment not available ashore. Rendezvousing with REPOSE off the coast of RVN for the last time in March 1970, SANCTUARY watched her sister ship depart for home on 14 March 1970.

The complexion of the conflict was changing and its effect was felt on the Hospital Ship. Disease admissions outnumbered injuries (both hostile and non-hostile) two to one, with malaria, gastrointestinal infections and other fevers leading the list.

The early 1970 troop withdrawals followed by the return of USS Repose to the U.S. and the closing of NSA Hospital DaNang, in May, contributed to 1970 being SANCTUARY's second busiest year in the number of admissions: 6,354. In June there were 965 admissions, a record monthly total. The fast pace continued through September to be followed by three months of relatively light patient loads.

The overall end result was a busy Medical Service and an anxious-to-do-more Surgical staff. More elective cases from the local civilian population were treated than before.

A seemingly rapid turnover of professional staff contributed to the changing scene. Five nurses from NSA Hospital and sixteen Nurse, Medical and Dental Corps officers from the REPOSE joined the SANCTUARY

staff for tours of from four to nine months. Ten enlisted men from the REPOSE added to this "short tour" picture.

The arrival of summer brought the first swim call for the crew within the memory of anyone on board. Beach parties at Spanish Cove near the DaNang harbor entrance became regular affairs, weather permitting. Jogging around the weatherdeck after duty hours, which had always been routine for a few exercise enthusiasts, seemed to gain in popularity when nurses in slacks and sweat shirts joined the group.

Unusual weather conditions in October had the ship evading two typhoons by steaming as far south as Qui Nhon, and riding out another while tied up at Rivera Pier in Subic Bay. During four days of torrential rain and gale force winds, the ship rode at anchor in DaNang.

The scenery changed with a shift of the ship's operating areas. China Beach, just south of Monkey Mountain, and Perfume River, near Phu Bai and Hue, replaced Wunder Beach in the regular schedule during the summer and fall. Three days a week were still spent in DaNang harbor; in November these visits lengthened to five, and later to six, days a week.

Finally, the rumor mill worked overtime giving the ship a new estimated time of departure almost weekly. In the Wardroom and on the mess decks it became fair game to see who could start the best rumor.

Deployed in Vietnam on a non-rotating basis, SANCTUARY normally spent only a ten-day upkeep period in Subic Bay, Republic of the Philippines, per three months of Vietnam operations. During these unprecedented time periods served on the line, SANCTUARY has earned the respect and admiration of all observers. She was twice awarded the Navy Unit Commendation for her meritorious service in Vietnam.

USS Sanctuary (AH-17) Commanding Officers

CDR John M. Paulsson, USNR,
LCDR Michael D. Dearth, USNR,
CDR William Van C. Brandt, USNR,
CDR John C. Jones, USN,
LCDR Douglas C. Hahnenkratt, USN,
CAPT John F. Collingwood, USN,
CAPT John L. Neff, USN,
CAPT Chester E. Briggs, USN,
CAPT Bryan B. Brown, Jr., USN.

20 Jun 1945 — 11 Jul 1945
11 Jul 1945 — 26 Jul 1945
26 Jul 1945 — 3 Nov 1945
3 Nov 1945 — 26 May 1946
26 May 1946 — 15 Aug 1946
15 Nov 1966 — 27 Feb 1968
27 Feb 1968 — 18 Jun 1969
18 Jun 1969 — 17 Jun 1970
17 Jun 1970 —



CAPT B.B. Brown USN, CO USS Sanctuary, presents award (left photo).

Commanding Officers, Naval Hospital in USS Sanctuary

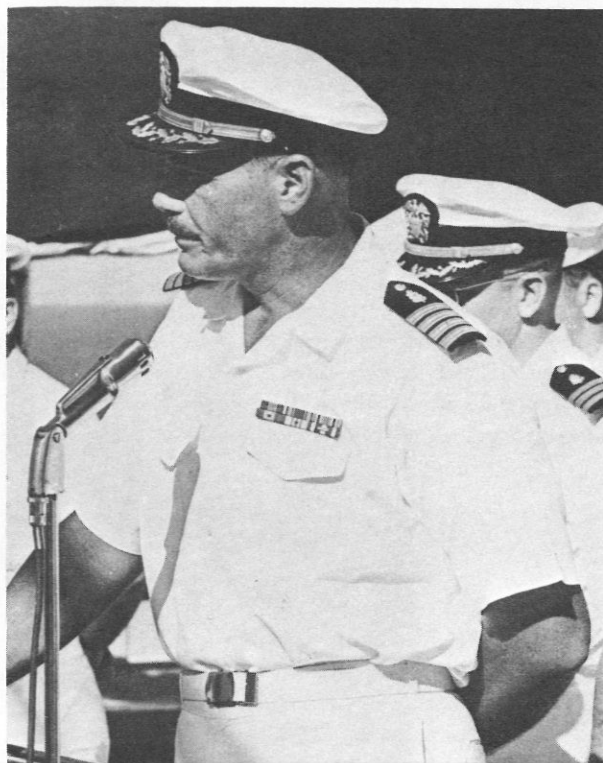
CAPT Gerald J. Duffner, MC, USN
 15 Nov 1966 — 24 Oct 1967
 CAPT Donald W. Robinson, MC, USN
 24 Oct 1967 — 7 Sept 1968
 CAPT Willard P. Arentzen, MC, USN
 7 Sept 1968 — 1 Aug 1969
 CAPT George J. Taylor, III, MC, USN
 1 Aug 1969 — 8 Apr 1970
 CAPT Elgin C. Cowart, Jr., MC, USN
 8 Apr 1970 —

From: Commanding Officer, Naval Hospital,
 USS Sanctuary (AH-17)

An issue of U.S. Navy Medicine devoted to USS Sanctuary at this time is particularly appropriate. By the time most readers receive this volume SANCTUARY may well be on the long voyage home after more than four years deployment in Southeast Asia. The last U.S. Navy Hospital Ship to be built, the last to be commissioned and re-commissioned, the last in active service with the fleet may be steaming to her last berth. At the time of this writing neither the OUTCHOP date nor the final disposition has been firmly established.

The opportunity to prepare material for publication in this issue of Navy Medicine was eagerly accepted by both present and former staff members — physicians, nurses and corpsmen alike. Their enthusiasm was evidenced by the quantity of good material submitted on relatively short notice. The response, however, was no more than typical of the manner in which they have performed throughout this entire tour. It has been a privilege to have such a staff and a source of pride to have served on this White Lady.

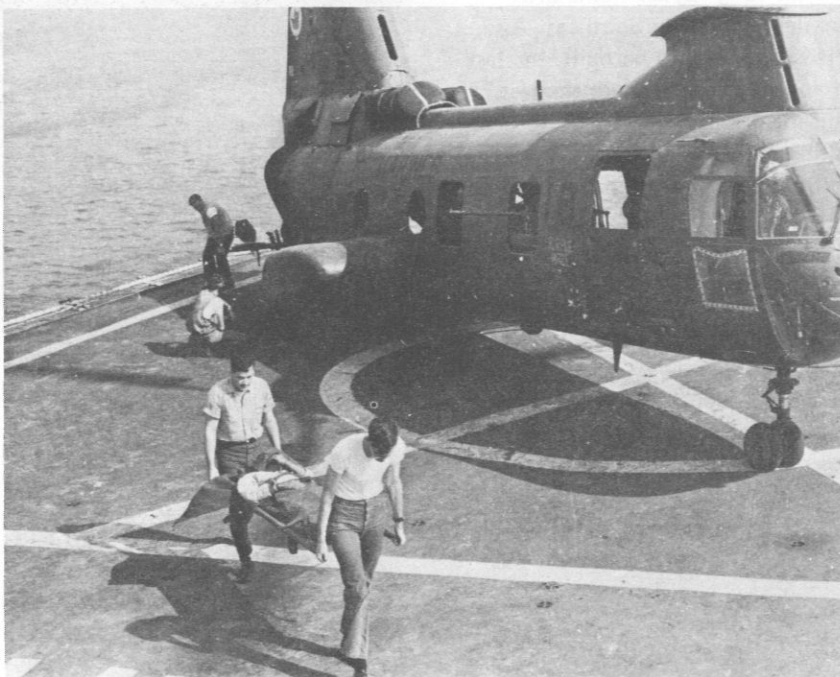
s/Elgin C. Cowart, Jr.
 CAPT, MC, USN

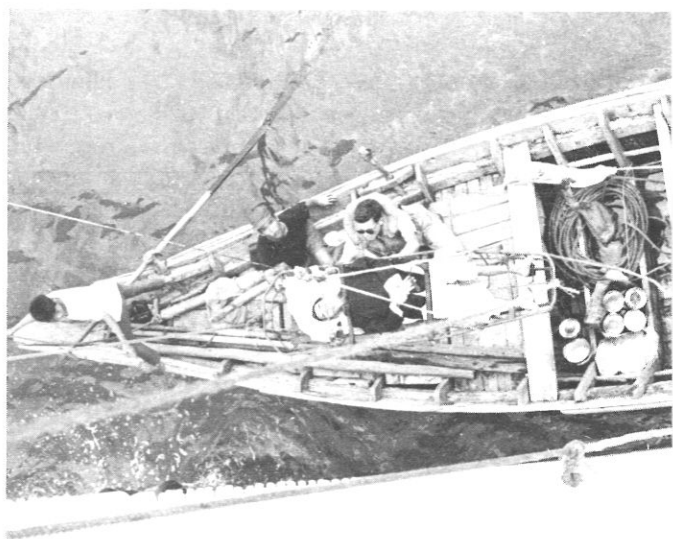


CAPT E. C. Cowart, MC, USN, CO Naval Hospital in USS Sanctuary.



COME UNTO ME





Surgery and Dentistry

Since April 1967, SANCTUARY has admitted over 23,000 patients. Through Dec 1970, over 10,000 patients have undergone major operative procedures. More than 30,000 other procedures, such as wound debridements, dressing and cast changes, and laceration repairs, were carried out in the Recovery Room, clinics and ward treatment rooms.

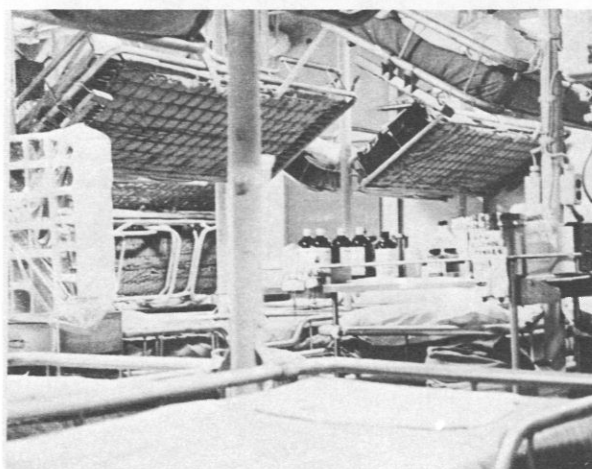
The majority of hostile action wounds are caused by explosive devices, land mines and booby traps. The wounds are extensive, involving mostly the lower extremities and perineum. Penetrating abdominal, thoracic, and head wounds are also common. Too frequently combinations of all these injuries occur in the same patient. Wounds from high velocity missiles are relatively rare.

There are three completely equipped operating rooms, two anesthesiologists and a nurse anesthetist. There are three nurses and from 9-12 fully trained, outstanding operating room technicians. At times of

massive casualty admissions, all three O.R. rooms have run simultaneously, often with multispecialty procedures underway on the same patient. The operating rooms are located at the center of the ship, to minimize rolling and rocking motion. Surgeons just reporting aboard have to learn to overcome any tendency toward sea sickness, to operate uphill and downhill with the ship underway, and to wait for the O.R. light to swing back into the field. The anesthesiologist learns to chock-block his anesthesia machine with one foot, while hooking the table with his other foot to avoid sliding away from the patient.

The ICU has 18 beds; each nursing shift ordinarily consists of two nurses and four corpsmen (more if patient load dictates). It is equipped with wall suction, piped-in oxygen, and four beds with EKG monitoring capability. All seriously ill or injured, and major postoperative patients, are treated in this unit until their condition improves sufficiently to permit transfer to a ward.

ICU NURSES



SURGICAL WARD

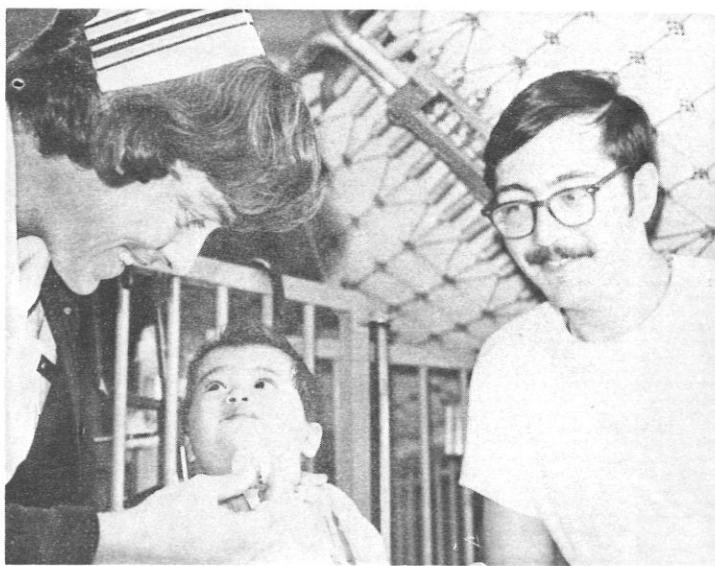
General Medical Officers

Six General Medical Officers complement the fully trained staff of surgeons, anesthesiologists, internists and subspecialty surgeons. Each doctor rotates through a three-month period in each of the following departments: medicine, general surgery, orthopedic surgery, and thoracic and neurosurgery. Primary duties involve triage of incoming patients, ward medical care, and staff sick call. The General Medical Officer accompanies the acutely ill patient from triage, through X-ray, and on to the O. R. A unique introduction to tropical diseases is afforded by the Medical Dept. Among the present GMO physicians, all Vietnam volunteers, several specialty careers have been spurred by the unusual clinical experiences and available opportunities.

Nurses

"Your emotions run a gamut never before experienced in a more controlled medical care facility."

"The nurse's experience in a war situation, differs only in intensity."



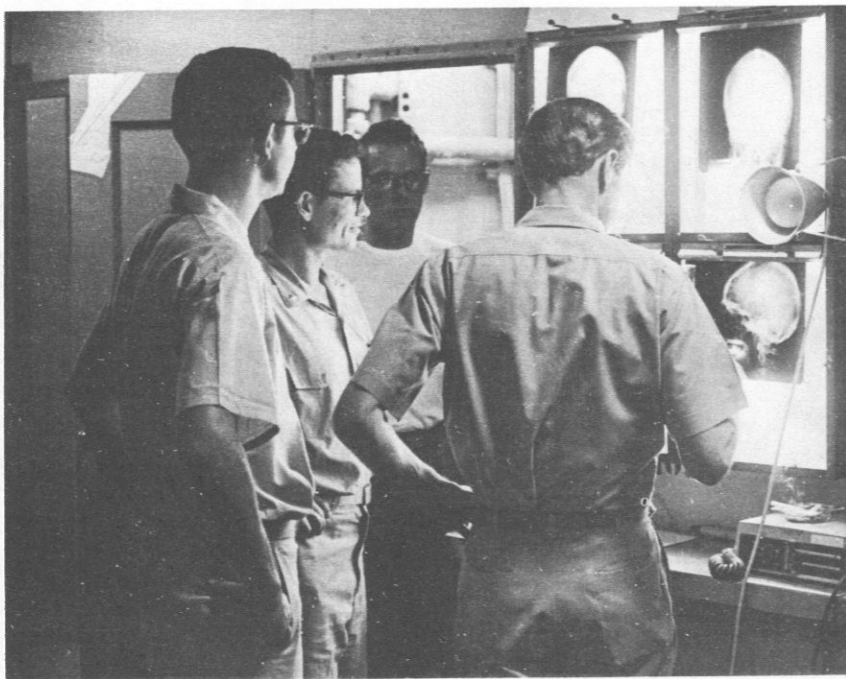
Among Vietnamese patients, many infectious, metabolic, and neoplastic surgical diseases are encountered. Typhoid fever with ileocecal complications, amebomas, gonorrheal urethral strictures, amebic liver abscesses, parasitic intestinal obstruction, and bacterial and tuberculous empyema represent but a few such problems. Nephrolithiasis, ureteral and bladder stones are very common, while cholelithiasis is rare. Cancer of the breast, colon, lung and cervix are uncommon. Gastroesophageal, hepatic, head and neck cancers are frequently presented. Rheumatic heart disease, especially mitral stenosis, is often diagnosed. Three closed mitral commissurotomies were performed on SANCTUARY in the past two months. An unlimited volume of elective surgery for all the surgical specialties is presented by the civilian populace, if operational commitments and hospital space could accommodate liberal scheduling.

Morale is undoubtedly highest when work is hardest. There can be no greater unhappiness than in the presence of motivated surgeons with nothing upon which to operate. It's tough to sit and wait!

Radiology

The hazards of X-ray examination and fluoroscopy at sea, with six to ten-foot swells, are evident. It takes one technician to hold the fluoroscopy unit and another to change the films, while the radiologist examines the patient. If a technician releases his hold on the unit to attend the patient, the equipment travels forcibly against the bulkhead, an overhead unit can be placed out of commission, and part replacements will take some time to acquire. At anchor, one encounters a port or a starboard list. Actually a starboard list is preferable. In this situation the heads won't work and it's difficult to conduct barium enemas. With a port list, the fluoro unit gets a head start (all downhill), and it's difficult to stop.

Much experience in traumatic radiology is gained. With three functioning rooms, total body examinations on 8-10 patients can be conducted and completed in less than 30 minutes. This is essential in rapid disposition and treatment of acutely injured patients. Eight splendid technicians in the X-ray Department ensure proficient patient care in mass triage.



Hospital Corpsmen

"I've seen the ship's company work day and night, day after day, so we could do our job. It's the teamwork I always heard about, but never saw."

"SANCTUARY speaks louder than any bomb."

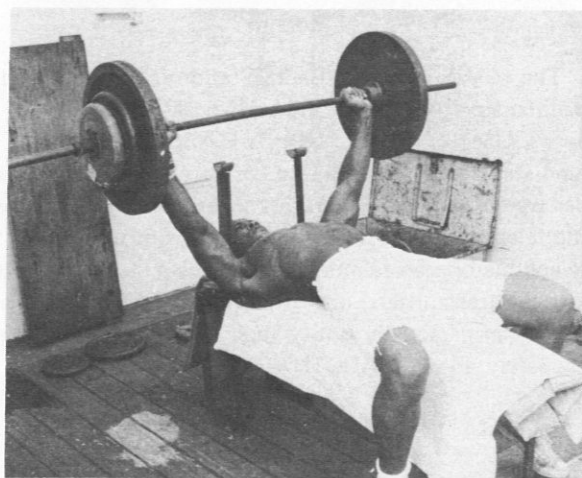
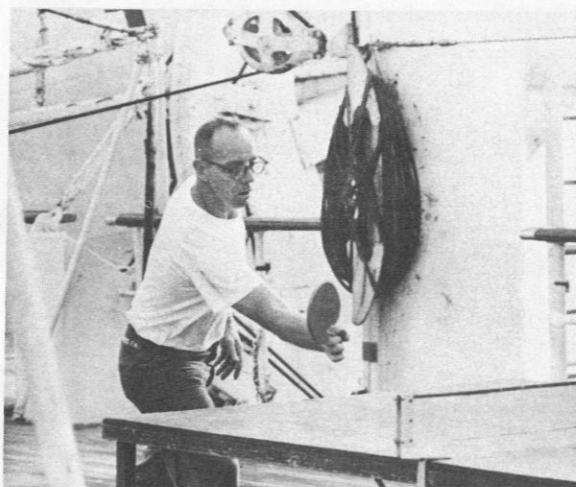
"To see the need does something to a man. If I gave 100% it couldn't be enough."



Morale

The MARS Amateur Radio Station is operated and maintained for patients and staff by M/Sgt F. W. Justis, USMC. SANCTUARY's MARS Station has nine stations in CONUS that are contacted seven days per week. Amateur operators throw a switch hooking the telephones into the radio sets. From there on, telephone operators monitor the calls and key and unkey the transmitters, until transmission time is up. Patients can personally notify their next of kin that they are safely aboard SANCTUARY.



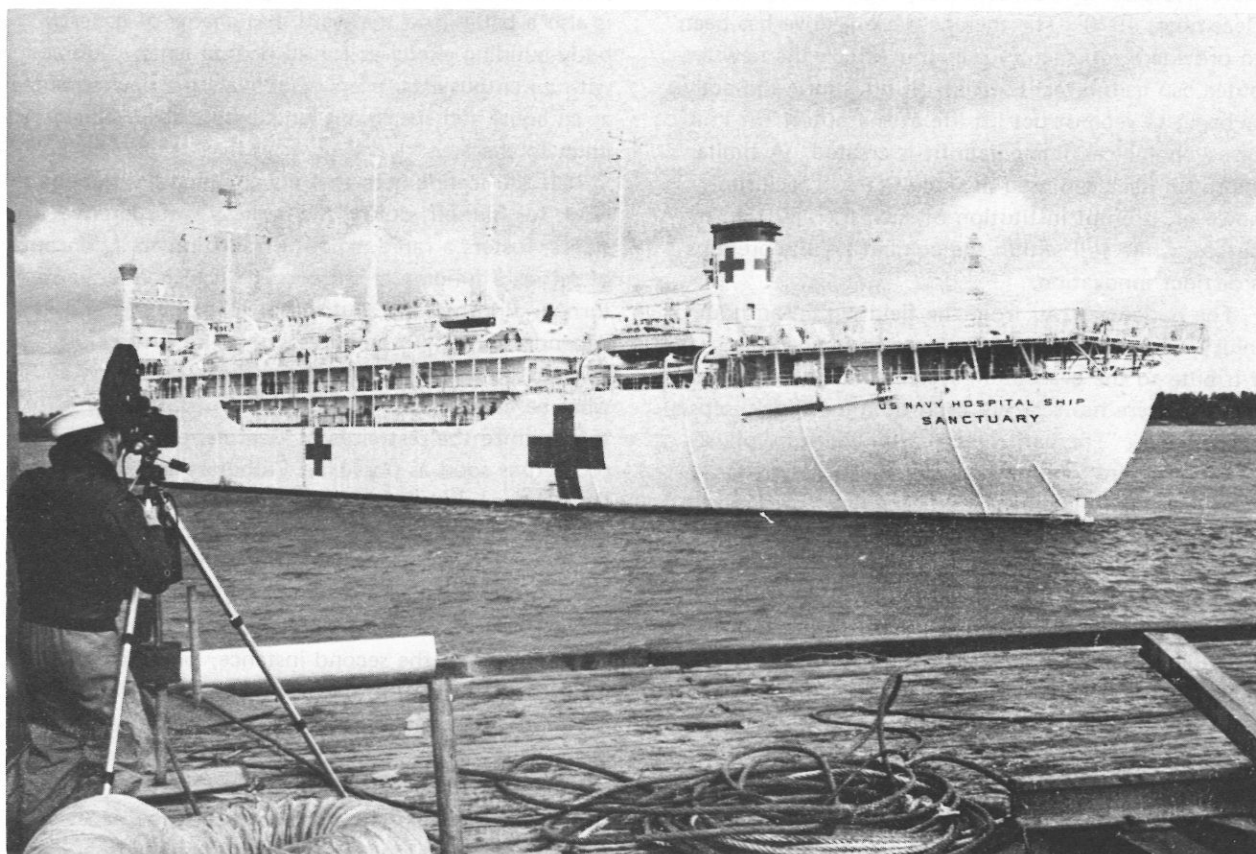


The Armed Forces Naval Hospital Network (AFNH) provides seven hours of radio and nine hours of television for patients and staff over a closed-circuit audio wire system. The station is known as "The Voice of the South China Sea".

The "little pleasures" represented by the "Liberty" boat, or a turn about topside during interludes of relaxation, provide only a superficial view of morale factors. There is a deeper sense of morale, long and elaborately depicted by historians as the spirit and stout-hearted quality that win battles for resolute men. Of this precious commodity, SANCTUARY gives far more

than she requires. Following a visit to SANCTUARY a few years ago, GEN L. F. Chapman, Jr., Commandant of the U.S. Marine Corps, expressed this very well in a personal letter addressed to the ship:

"After my most recent visit to the SANCTUARY, I came away with the satisfying belief that you, your doctors, nurses, corpsmen and crewmen are doing a tremendous job for our sick and wounded. Having any Marine become a casualty is always a source of concern, but the knowledge that teams such as yours are standing by to care for our men is certainly a comfort. Thank you and keep up the good work." 🇺🇸



USS Sanctuary (AH-17), prior to recommissioning on 15 Nov. 1966 at New Orleans, La. (Courtesy of HMC R.M. Johnsen, USN).

REHABILITATION OF THE ACUTE WAR AMPUTEE:

A MULTISPECIALTY APPROACH

By LT D. Seligson, MC, USNR; LCDR W. A. Hiskett, CHC, USN, and; CDR R. J. Bailey, MC, USN; Naval Hospital in USS Sanctuary (AH-17); DaNang Harbour, RVN.

No injury created by the mischances of war is more devastating to youth than the amputation of a limb. The deformity is obvious, the loss permanent, the disability lifelong. The following report briefly surveys the management of 76 amputees treated aboard the Naval Hospital in USS Sanctuary from 1 May to 30 December, 1970. The therapeutic objective has been to provide a satisfactory milieu in which the new amputee can gain a realistic view of his injury and actively begin to reconstruct his life at the outset. A kind of psychological, immediate fit is created. A similar approach has been used in some CONUS facilities, however, prompt institution of such therapy for amputees, while still within the combat area, represents a distinct innovation.

The patient arrives from the field within an hour of injury, often within 20-30 minutes by helicopter. It is a tribute to the evacuation system that they come so rapidly; there has scarcely been time for shock, sepsis, pain or fear. The patient is met in Triage by physicians, chaplains, and hospital corpsmen. His vital signs are stabilized, X-ray studies are obtained, and preoperative preparation is completed. The injured extremities are still covered by battle dressings, and there is evidence of dirt, sand, and grass on the hurriedly bandaged wounds.

It has been the practice here for the surgeon to speak simply and directly with the patient, explaining what will be done. Having in fact seen the extremity at the time of injury, the wounded man is usually well aware of what is going to be necessary. His usual reaction is, "Well, I'm glad to be alive."

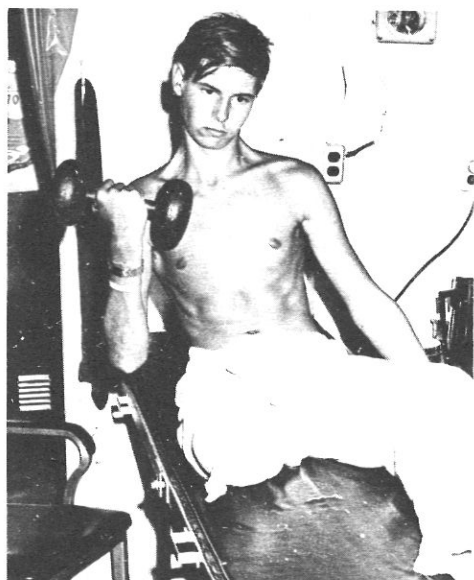
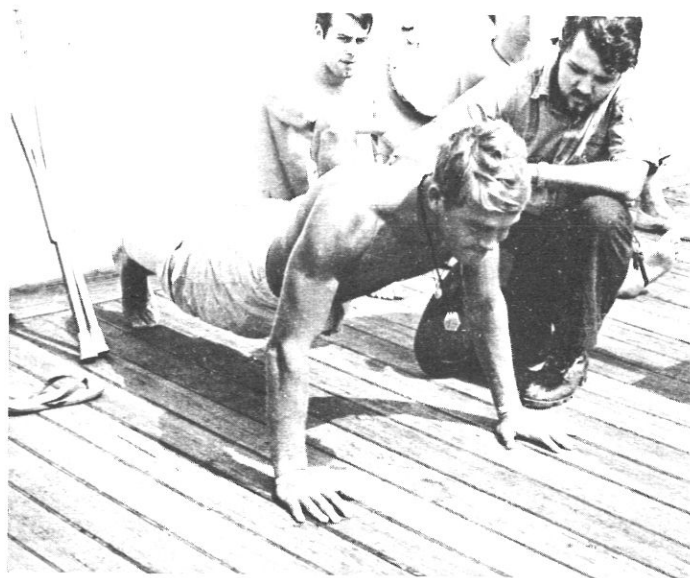
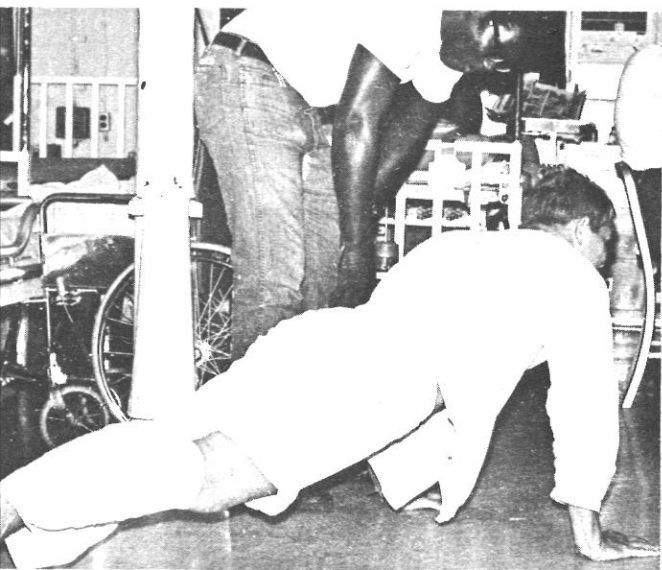
The chaplain meets the patient in Triage, helps move him from stretcher to X-ray unit, talks with him, and establishes a solid relationship as a helpful, interested, and trusted counselor from the beginning.

An active program of rehabilitation commences as soon as the patient leaves the surgical suite. He is usually taken directly to the open ward, unless associated injuries or the sequelae of shock and blood replacement necessitate assignment for a time to the Intensive Care Unit. The patient begins by exercising

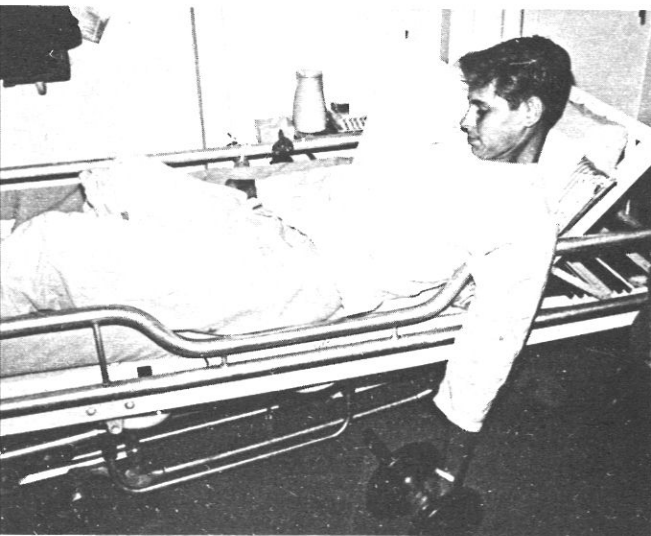
uninjured limbs the first night following surgery. During the subsequent one to two weeks onboard he is progressively advanced to push-ups, chin-ups, sit-ups, barbells for the upper extremities, crutch walking and stump exercises, under the supervision of a trained physical therapy technician (Figs. 1-5). An NCO, who is also a patient on the ward, has charge of general body-building exercises for all bed patients. Contact with an enthusiastic peer, who treats the new amputee as an equal and speaks his language, is an invaluable adjunct to therapy.

It is the feeling here that encouraging the patient to work for himself, during the earliest postoperative stages, fosters a rapid, smooth transition to a concept of self as a functional person. The goal is not the return to a normal life, but rather to a realistic and independent life. An amputee knows he is not normal; it is all too visible. He explores what he can do and what he cannot do. The physician makes every effort to minimize the restraints of treatment. A full diet is ordered as soon as possible. Catheters and intravenous lines are rapidly discontinued. There is an initial rapid progress and morale is high. Daily dressing of these open and painful wounds is handled in two ways. First, it is avoided in certain carefully selected patients by closing the stumps immediately, or following a short delay. In the second instance, where wounds must be kept open, intravenous analgesics are provided during the first few days. The chaplain makes a regular practice of attending dressing change sessions. His presence is of incalculable benefit to doctor and patient. The men readily come to accept the necessity for dressings and soon prefer a full day's normal activity (bowel regularity, good appetite, and a proper sleep-wake cycle) to the transient and artificial euphoria of narcotics. They do not regard the day as a series of time intervals between injections for relief of pain. The need for analgesics, tranquilizers and hypnotics becomes minimal.

In our opinion, the whole problem surrounding the grief syndrome must be dealt with promptly. All of the grief experiences that accompany the loss of a



Figs. 1-5. He is progressively advanced to push-ups, chin-ups, sit-ups, barbells for the upper extremities, crutch walking and stump exercises, under the supervision of a trained physical therapy technician.



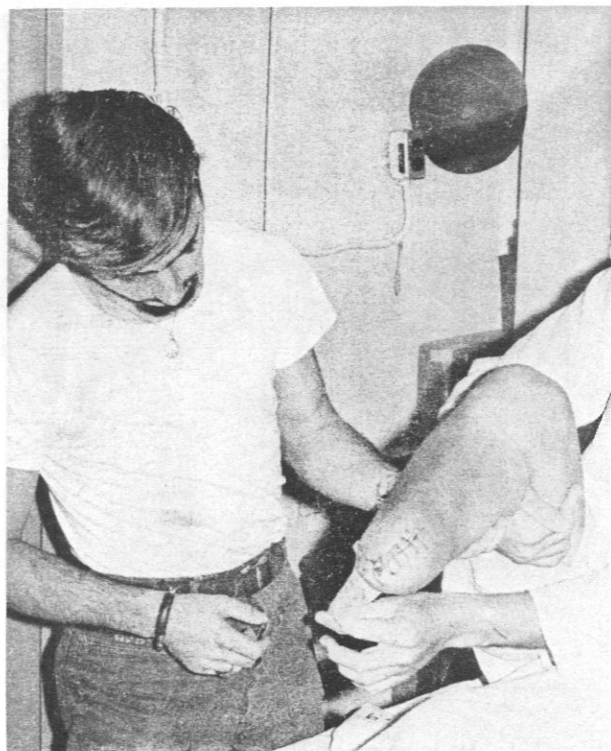


Fig. 6.

loved one are evoked by the loss of a limb. Emotional shock, panic, pain, hostility and guilt are all encountered during the recovery and rehabilitation of the amputee. The patient is not permitted to discount or deny that his problem exists. Emphasis is honestly given to the immediate need for positive action and the futility of worrying, not to the denial of cause for worry. Attitudes of despair and hopelessness are averted by combating seclusion and rationalization. Prompt adjustment to the loss of limb is promoted by supportive treatment and the patient is assisted in dealing with the loss creatively and effectively.

To complement the progress made by the patient in regaining strength and healing wounds, preliminary steps are taken to refit the patient to his community. The nurses and corpsmen insist that the patient care for himself, and his stump, in every possible way (Figs. 6-8). He is required to shave every day and must meet the same standards of neatness and personal grooming that are required of his fellow patients. He is encouraged to use standard toilet facilities as soon as possible. Bed baths are eliminated and he stands under the shower, with assistance. Corpsmen work extremely well with the new amputees. In their inimitable good-natured manner, the hospital corpsmen push hard, but not too hard.

The assistance contributed by the line officers aboard ship merits recognition. Detached from the

immediate medical aspects of the problem, the line officers are able to talk personably and often skillfully with the patient about experiences, his home, his girl. They visit as interested friends apart from the medical necessities, conferring respect and dignity on distasteful situations. They lend a tone of compassionate understanding and enthusiasm to the enterprise; they have time to listen. Red Cross workers provide books, newspapers, and even chewing tobacco. They help with letter writing, arrange for message transmittal and assist with short wave radio calls home. Other patients escort the new amputee about the decks, to the movies, to sunbathe, to church, or to the barber shop. The more mobile patients go to the mess decks for chow.

The chaplain works with the crucial task of refitting the patient to his community. The key to our therapeutic approach is the early introduction of positive attitudes for the future, despite the fact that the casualty is still located in the combat area and only in the beginning phases of recovery. His unit scattered by transfers and rotations, the patient has been separated from his buddies, his concerns, his belongings, and his familiar routine. Even the integrity of his body has been violated. The chaplain is uniquely qualified to penetrate the desolate confines of such deprivation.

The distortion of body image is one of the major concerns of the new amputee. The young man worries about the reaction of others — what they will



Fig. 7.

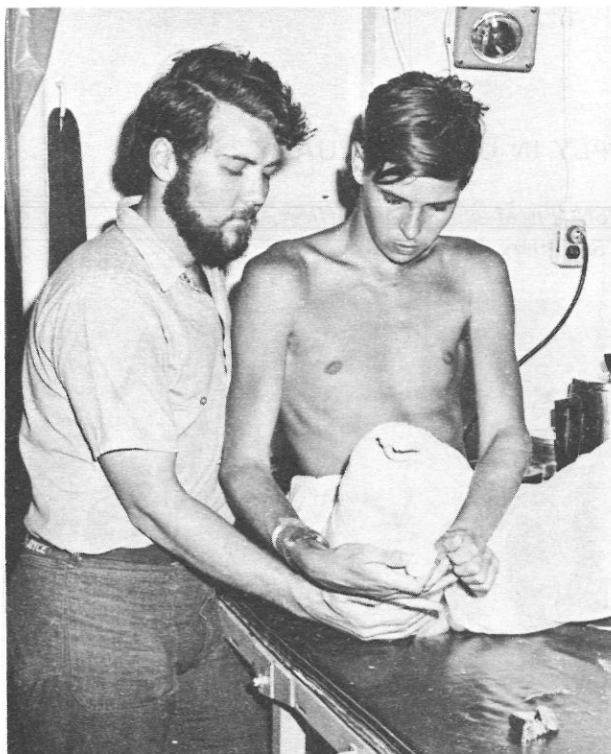


Fig. 8.

think; he is preoccupied with the mechanics of living in his new situation. He wants to know what his prosthesis will look like, and how he will use it to get about. These matters are discussed freely and frankly. There will obviously be some things that the patient will be unable to do, particularly in contact sports, but there are many other things he will be able to do. He is told what will be practical and reasonable to expect.

(Continued from p. 50)

The JAMA letter written by Elliott A. Hilsinger, M.D., Cincinnati, Ohio, recommends immediate plaster splint support of the calcaneo-fibular ligament, and similar support of the internal ligaments on the opposite side of the ankle when indicated. Approximately six to eight thicknesses of plaster splints (according to patient's weight), extending from the inside of the arch (opposite the injury), entirely under the arch, and eight to ten inches above the injured condyle, are employed. A little cotton padding is applied beneath the plaster support, and two or three thicknesses of padding or gauze are applied around the injured ankle to protect the skin. The plaster splint is wrapped with

The popular picture of the below-the-knee amputee performing a double somersault dive is not encouraged, not because we assume that the patient cannot do it, but because of our firm conviction that it is better to strive for accomplishment that is realistic and reasonably attainable.

Patients are counseled to seek careers that will reconcile their handicaps with their ambitions. The boy considering work in a conservation service as a field forest ranger starts to consider returning to work in the fish hatchery where he was employed prior to military service. A bilateral amputee with previous experience in physical therapy will take advantage of his veterans' benefits to become an expert. Patients are encouraged to consider the positive satisfactions provided by school, job, and family. Many wonder about their relationships with loved ones. An effort is made to guide the man into a position where he will not be devastated by the reality of disappointment, nor inclined to underestimate his assets and sell short.

In summary, a method of managing the initial treatment of amputees is presented, stressing the need for coordination of multiple disciplines and personnel. The program is designed to return the acute combat patient to productive living as smoothly, rapidly, and realistically as possible. The presence of a modern naval hospital within the combat area has not only provided for the initial physiologic stabilization and emergency surgery traditional in the front line hospital, but has also made it possible to introduce a rehabilitative effort unique in these circumstances. We believe that patients discharged from our unit are better prepared to accept the final phases of limb-fitting and adaptation to civilian life. It is hoped that this effort will contribute to the preservation of spirit, strength and vitality of our youthful casualties. ☸

more gauze to fix its position on the foot. The supported foot is placed in a large wearable shoe which may be split if necessary. By having the patient stand erect, bearing considerable weight upon the ankle, the plaster splint is moulded in the shoe; the balance of the cast above the shoe is moulded by hand. When the plaster begins to harden, the patient sits down until the cast is dry. Removing the shoe, the moulded splint is supported entirely by adhesive to protect its exterior from the shoe. The shoe is replaced and the foot should be kept elevated, with an ice pack outside the splint, for 24 hours if possible. Most patients can return to work the following day, reports Dr. Hilsinger. ☸

MEDICAL FISCAL AND SUPPLY IN USS SANCTUARY

*By LT Patrick H. Moore, MSC, USN, Fiscal and Supply Officer,
Naval Hospital in USS Sanctuary (AH-17).*

Take the Fiscal and Supply function of a 500-bed naval hospital, add a completely equipped medical repair department, move it 7,000 miles from the primary source of supply, drop it in the bowels of a big white ship, and you have created the Fiscal and Supply Division (HF Division) of the Naval Hospital in USS Sanctuary. The ship is like an island isolated in DaNang harbor, several miles from shore where there are no delivery trucks and no loading docks. All supplies are delivered by boat or helicopter.

The supply function on board SANCTUARY is roughly divided into two categories, ordering and receiving. Ordering involves submission of requisitions to various stock points. Receiving includes transfer of stores from the stock point to DaNang and from DaNang to SANCTUARY.

Inventory control is the first echelon of the ordering process. Inventory levels are based on a three-month supply period for a census of 400 patients. Lead time for delivery of standard stock items is ordinarily one to two months and open purchase items generally take longer. These delivery times are based on an issue priority designator of 09 on a scale of 20. (Priority 09 is considered routine for medical supplies in a combat area.) In unusual circumstances when the lack of an item will impair the mission of the hospital, a priority of 05 may be assigned. This results in delivery within one month, or less. An emergency priority of 03 is used to effect delivery within two weeks or less in the case of a critical item required to sustain life or accomplish the hospital mission.

A large variety of items is carried in medical supply. There are over 7,000 line items ranging from disposable diapers to electronic printed circuit boards. The 500 open purchase items stocked and ordered include such diverse products as special sutures, urinary prosthetic devices and artificial eyes. Over 200 items of office equipment and janitorial supplies are ordered from ships supply and stocked for hospital use.

One unique asset of the "Great White Ship" is the row of green oxygen tanks around the 01 level. Over 300 oxygen tanks are available for use in the hospital. A centralized oxygen system supplies the wards from a bank of 16 tanks. This vital life-support system has



HM3 G. A. Hausauer changes oxygen tanks on the Central Oxygen Supply Bank with the moral support of HM2 S.L. Seyb.

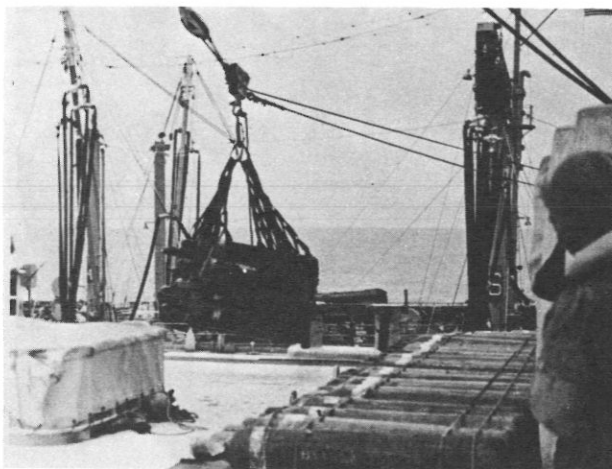
an alarm device which rings when the level of oxygen gets low, alerting the HF Division oxygen detail to change the tanks immediately at any time of the day or night. It is not unusual to change banks every 12 hours during periods of heavy usage.

The hospital has several supply sources but the present primary stock point is the Naval Supply Center, Oakland, Calif. All open purchase requisitions and most routine standard stock requisitions are forwarded to Oakland. Routine requisitions are submitted on a DD 1348 form, but priority 05 and 03 orders are sent via navy message to expedite delivery. Additional stock points include: Naval Supply Depot Subic Bay, Philippines; various stores issue ships operating in Vietnam, and; the Army support unit in DaNang. The Subic Bay Depot supplies the ship while there for the quarterly yard period. Stores issue ships primarily

supply oxygen and intravenous solutions. When a critical need arises, calls to the Army support unit or any medical facility in the DaNang area are followed by helicopter delivery of the desired item within a matter of hours.

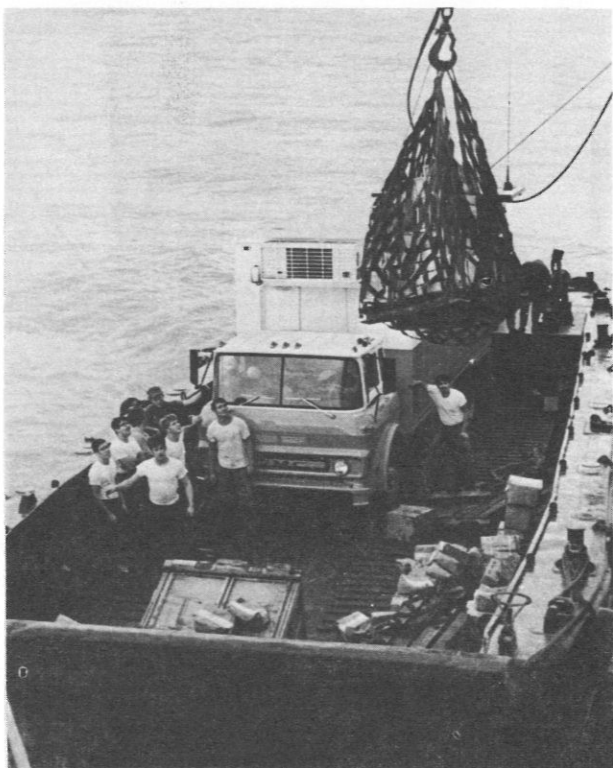
After arrival in DaNang, supplies must be delivered to the ship. Supplies are usually brought to the ship in a U.S. Army boat, reserved on a weekly basis. A truckload of supplies is driven onto a large landing craft which is brought alongside the ship. The ship's deck force rigs booms and lowers a cargo net to the boat; supplies are loaded into the net and hoisted to the forecastle.

When the ship refuels from a fleet oiler, the hospital avails itself of the opportunity to order oxygen. By highline, oxygen tanks are transferred from the oiler to the SANCTUARY. Underway replenishment and highline operation must be seen to be appreciated. About 100 yards apart and connected by a stout line with a pulley arrangement riding on it, both ships steam parallel courses at approximately 10 knots. With a 1500 pound cargo net of oxygen tanks swinging on the highline, sharp eyes and skillful hands are required to guide the load successfully from the oiler to the forecastle of SANCTUARY without a disastrous accident.

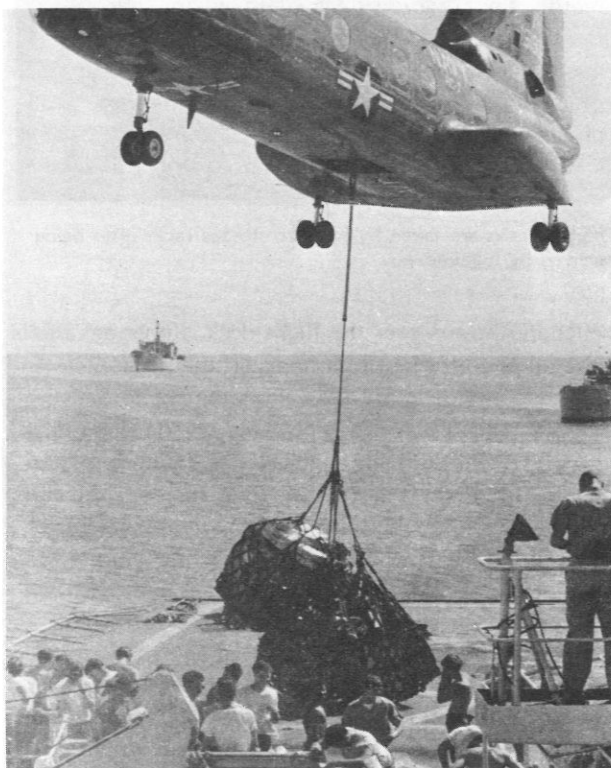


Stand clear of 1500 pounds of oxygen tanks — on a highline.

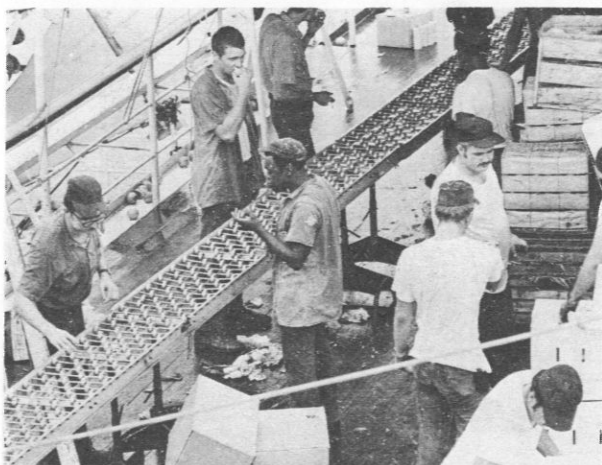
A third method of delivering supplies is vertical replenishment (VERTREP) utilizing helicopters. SANCTUARY is usually anchored in the harbor near a Combat Stores Ship (AFS). The AFS is a highly automated floating warehouse which carries two helicopters, a hangar and a large deck. The Supplies are staged on the helicopter deck of the stores ship in cargo nets. Long rigid booms are attached to the nets. As a



"Mike" boat carries dairy products to SANCTUARY from DaNang.



During VERTREP supplies are deposited on deck of SANCTUARY.



A brief "break" during a VERTREP — the conveyor carries supplies from the helo pad to storage area.



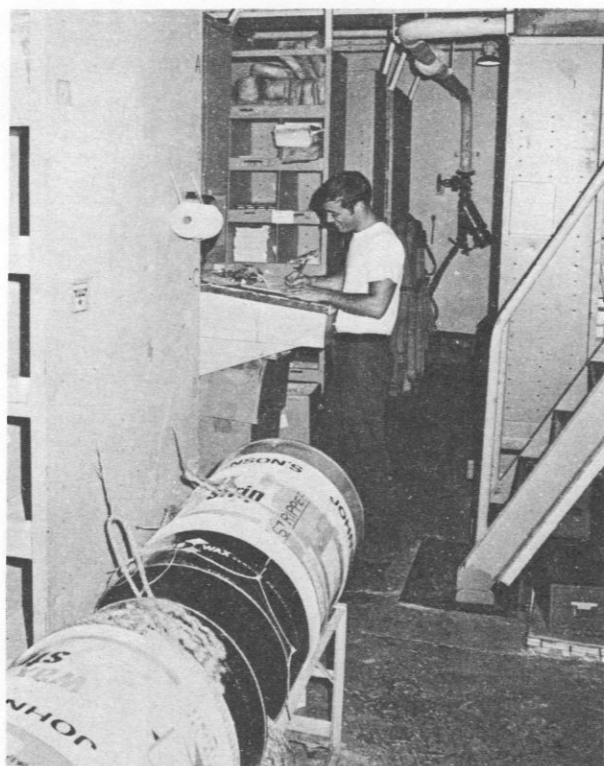
Oxygen tanks are taken by hand to storage racks after being received by highline.

helicopter hovers over the flight deck, the boom end is elevated and attached to a hook on the helicopter. The helicopter lifts off and carries the net to SANCTUARY, where it is gently lowered on the flight deck.

VERTREPS normally involve large volumes of supplies — provisions and general stores for the ship, and medical stores for the hospital, including oxygen and large quantities of IV solutions. It is not unusual to transfer more than 150 tons of supplies and over 10% of these may be medical. Due to the quantities of material involved, a VERTREP is an all-hands evolution for the ship and the hospital. It requires over a hundred men, working in perfect unison, to keep the helicopter deck clear for the next load of supplies. With two helicopters shuttling, each carrying up to two tons, a load may arrive every three to five

minutes. After the stores are cleared from the helicopter deck, another hundred men, in a human chain, labor to move the supplies along rollers, up two decks on a conveyor belt to the 03 level where they are stacked, awaiting transfer to storerooms.

Regardless of the method of ordering or delivery, transporting stores into the storerooms requires hard manual labor because of the layout of the ship and the location of the medical supply spaces. The SANCTUARY has a converted C-4 cargo hull and was initially designed to haul bulk cargo. Primary concern was given to patient care and handling at the time of her conversion to a hospital ship. Medical supply spaces are located on the hold level, which is three decks below the main deck. Below the main deck there is no connection between the three holds assigned to medical supply. Moving from one hold to the other involves going three decks up and three decks down again. Hold 1 is located all the way forward and is entered from the forecastle. It is used for storage of medical evacuation gear and excess medical supplies and equipment. Hold 2 is located below male officer berthing; it is used for storage and issue of bulk medical and general supplies including office and janitorial items. Hold 4, the main medical supply space, is located on the hold level below the X-ray and clinic areas. Hold 4 houses the

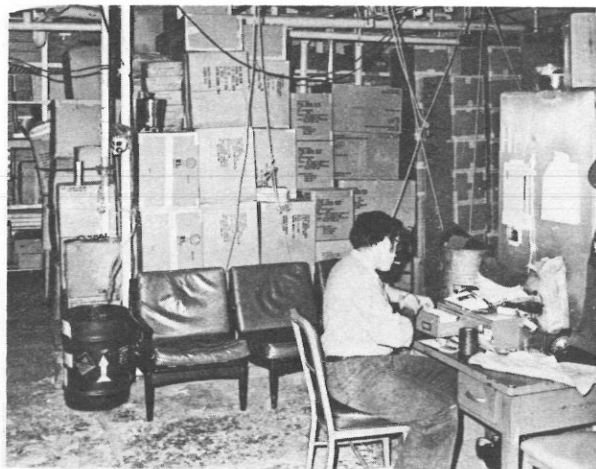


HM3 G. Crossland checks an order in hold 2.

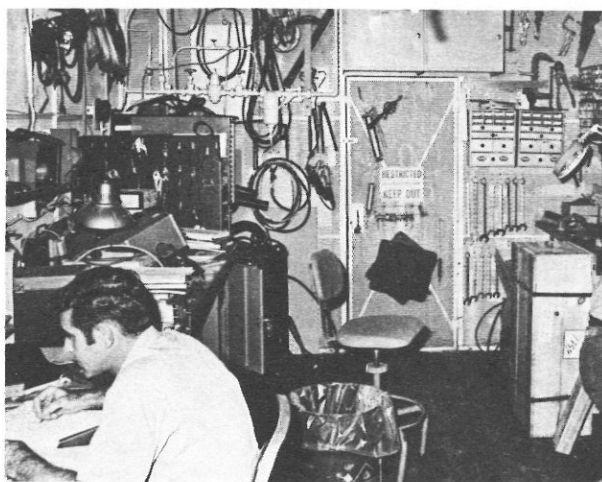
Supply Officer's office, main supply office, three storerooms and the medical repair shop. Most routine medical supply items are kept in the hold 4 storerooms. The storage areas are reached by descending steep, narrow ladders (except for the hold 4 elevator) and all supplies must be carried by hand. Occasionally when bulk supplies are received and the ship's deck force is not otherwise committed, it is possible to open deck hatches and lower supplies, with a boom, into the holds.

The Fiscal side of Fiscal and Supply is a smaller, but no less important part of the operation. The hospital receives a quarterly allotment of \$150,000 from Commander Service Force, Pacific Fleet for procurement of medical supplies and equipment. These funds are in the form of an operating target, not the Expense Operating Budget which other hospitals have. Much simpler than that required for an Expense Operating Budget, the bookkeeping for an operating target consists primarily of a single log in which all obligations are posted as they occur. Instead of the five or six accounting technicians usually required by a hospital of this size, the SANCTUARY Fiscal branch consists of one senior petty officer.

Although functionally independent, the Medical Repair department is located in HF division. Two



HM2 S. L. Seyb checks inventory cards in 6510 storeroom. Supplies are stacked to the overhead.



HMC H. D. Gaddis tackles necessary paperwork in the medical repair business.



HM3 D. D. Barber fills an order in the 6515 storeroom.

highly qualified HMC medical repair technicians are responsible for maintenance and repair of all technical medical equipment including X-ray, laboratory and patient monitoring gear. They are also called upon to repair all varieties of office machines and other mechanical equipment found in the hospital. Nonmedical work requests, such as plumbing repairs, are coordinated through medical repair even though the work is done by the ship's force. Another responsibility of the medical repair department is the comprehensive inventory of all hospital equipment, medical and nonmedical.

Available personnel for the Fiscal and Supply function varies from a body of fourteen men several months ago to nine men at the time of this writing. In addition there are two HMC's in medical repair and an HMCM division chief. HF Division shares with other



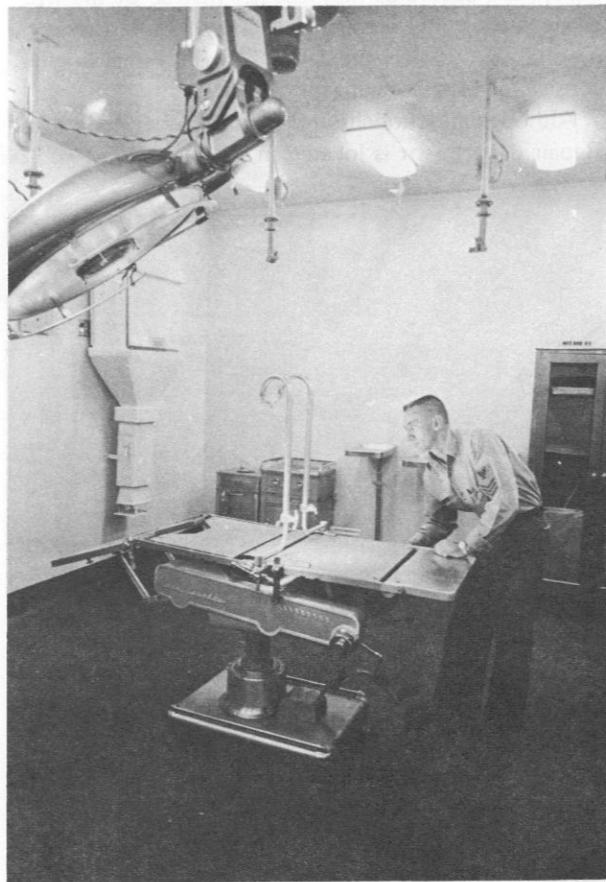
HMCM B. F. Broderick, Assistant supply officer and Division Chief, takes a rare break in the office.



CAPT J.F. Collingwood, USN, CO, USS Sanctuary, checked supplies on the pier with SK1 Odom in Nov. 1966.

Vietnam commands the rapid turnover problem created by the 12-month, in-country tour. All assigned personnel are rated HM's and few have had prior supply experience. Several months of training are usually necessary before full productivity can be achieved by a newly assigned man, and the training effort expended by more experienced personnel further reduces productivity. Each individual is assigned responsibility for one of the storerooms or assumes one of the clerical functions associated with ordering and receiving supplies. In addition to specific responsibilities, all hands turn to when supplies come aboard and all hands take their turn on the oxygen detail.

The tasks and functions of the Fiscal and Supply division are diverse and numerous. Through the constant, conscientious effort of all personnel, a highly effective and dependable source of "supplies to meet the mission and service to meet the need," is provided. ☸



HM1 G.D. Snyder, USN, positioned O.R. table aboard SANC-TUARY prior to her recommissioning in Nov. 1966. (Both photos courtesy of HMC R.M. Johnsen, USN).

MAXILLOFACIAL CARE FOR VIETNAMESE PATIENTS ON USS SANCTUARY

By CDR Thomas E. Stump, DC, USN, Oral Surgeon, USS Sanctuary (AH-17).

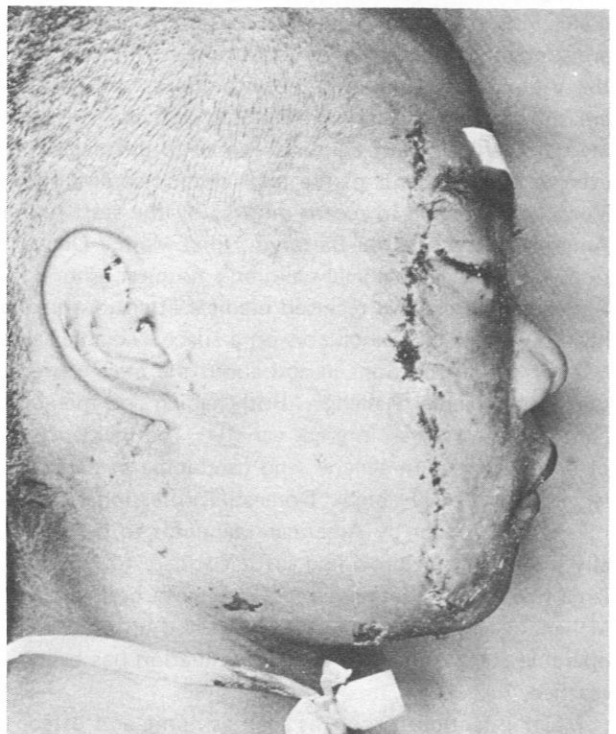
The need for maxillofacial surgical and dental treatment in Vietnam is great. An estimated five to ten per cent of all war-related casualties present significant maxillofacial injuries. Military patients include not only Americans, but those of all allied forces; the majority at this hospital are members of the U.S. Army and U.S. Marine Corps. Lesser but significant numbers of patients come from the Army of the Republic of Vietnam and from the Republic of Korea Marine Force. Enemy military captives requiring medical care are normally referred to shore installations such as the 95th U.S. Army Evacuation Hospital in DaNang, where appropriate security measures are provided. In addition to the military patients, the USS Sanctuary has also earned a reputation for providing emergency or specialty hospital service for the local Vietnamese civilian population. This article will deal primarily with the maxillofacial care provided to Vietnamese patients.

The humanitarian care provided to Vietnamese civilians is principally for war trauma. Most of this is "acute" or initial emergency treatment, but subsequent "reconstructive" care required by some of these patients is also provided as indicated, whenever possible. Hospital services are not exclusively confined to war-related injuries. The SANCTUARY hospital staff includes outstanding representatives of all the major medical and dental specialties, and can provide definitive treatment of a quality often unavailable in Vietnamese provincial hospitals ashore. The more challenging special problem patients identified by our colleagues in shore installations are therefore most often referred to the USS Sanctuary, where highly specialized surgical care is made available to needy Vietnamese of all ages. Children comprise a large percentage of this patient group.

In the maxillofacial field, the nonwar oriented surgery performed covers a broad spectrum. It includes



1-a. High velocity missile injury in ARVN member.



1-b. Postoperative view of patient shown in Fig. 1-a.

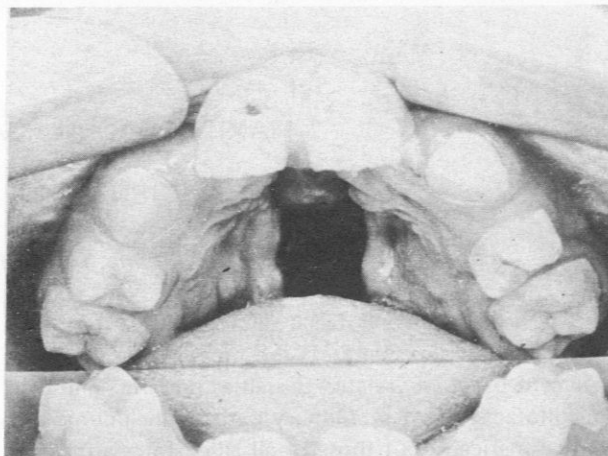


2-a. Facial view of repaired congenital cleft lip.

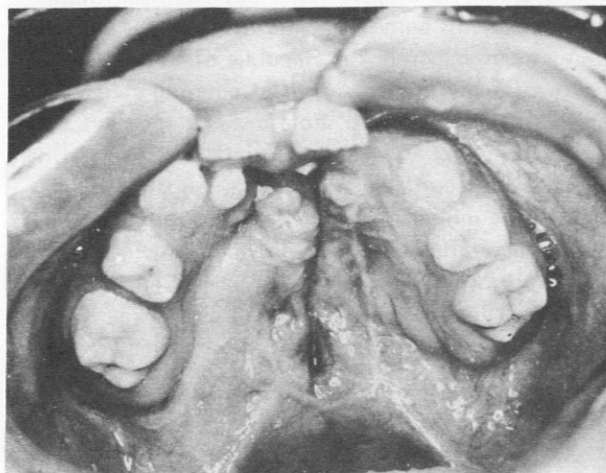
major and minor trauma of hard and soft tissues resulting from all types of accidents to the face and jaw area. Motorcycle and pedestrian automobile accidents are probably responsible for most nonwar injuries in the Vietnamese population. Congenital deformities are abundant. Surgically correctable cleft lip and palate deformities have frequently remained untreated even in older patients of the local civilian community. Many were treated in recent months by the staff of the American First Medical Battalion, First Marine Division, FMF, at a provincial children's hospital ashore. Additional cases have received medical attention on the hospital ship, USS Sanctuary, on a space available basis.

Neoplastic conditions in and about the mouth present a formidable challenge. Both benign and malignant lesions are seen in great variety. The incidence of oral neoplasia in general, and carcinoma in particular, is exceptionally high. Domestic professional facilities would appear by American standards to be generally inadequate in providing sufficient care for this large number of Vietnamese patients with oral tumors. Malignant lesions are too often neglected until an inoperable stage of growth and dissemination has been reached.

Major infectious problems such as noma and osteomyelitis are frequently sent to SANCTUARY. Noma is also known as cancrum oris or gangrenous stomatitis.



2-b. Preoperative palate view of case shown in Fig. 2-a.



2-c. Postoperative palate view of case shown in Fig. 2-a.

Although rarely seen in the U.S., it is relatively common among the Vietnamese, particularly young children. Malnutrition and debilitation undoubtedly contribute to the high rate of incidence. Systemic effects are profound and the mortality rate is high. An associated generalized exanthematous eruptive febrile condition is often noted — particularly at the time of the initial infection. Survivors frequently present permanent mutilations from necrosis and secondary scarring of the soft tissues about the lip and cheek areas. In young children these defects present challenging reconstructive problems.

The oral surgeon is charged with the major responsibility for maxillofacial care. By the nature of his work and training he tends to function as a member of both the dental service and the general surgical staff. Through the effective "team approach", the oral surgeon is actively assisted by associate medical/dental hospital staff members. Particularly close cooperation has been practiced between the otolaryngology and oral surgery



3-a. Preoperative view of Vietnamese child with developmental facial deformity and arrested growth of right mandible.



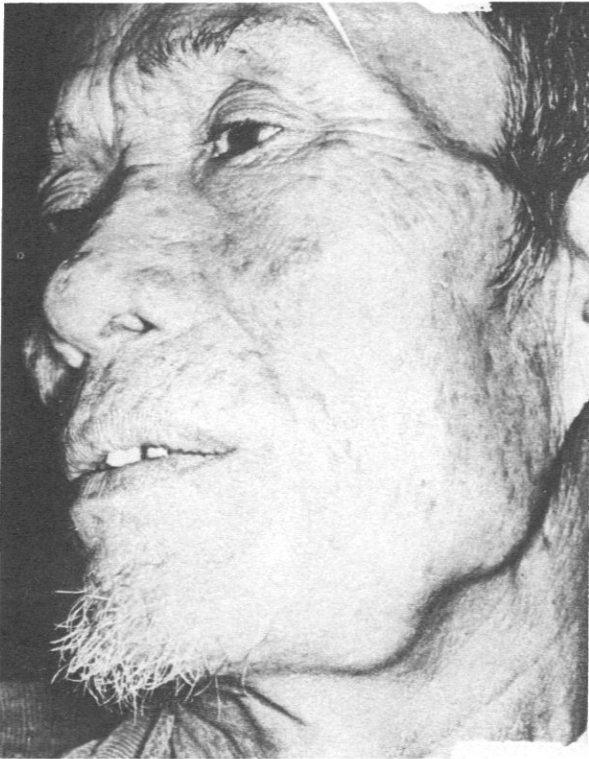
3-b. Postoperative facial view of case shown in Fig. 3-a.



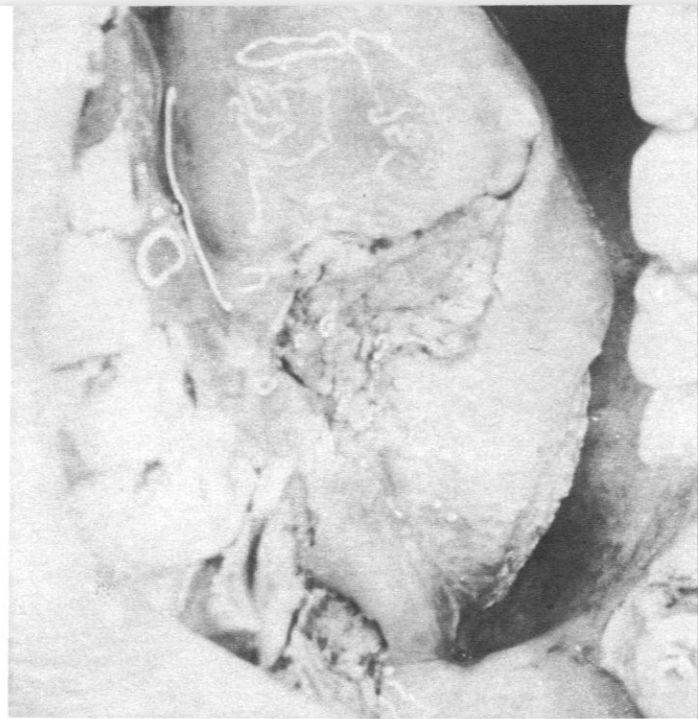
3-c. Preoperative profile facial view showing micrognathia of case shown in Fig. 3-a.



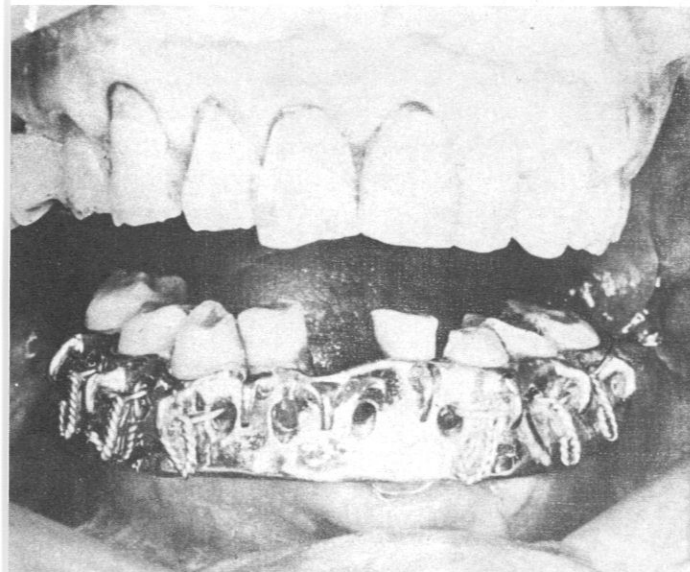
3-d. Postoperative right profile of case shown in Fig. 3-c.



4-a. Elderly Vietnamese civilian presents epidermoid carcinoma with metastasis to submandibular nodes.



4-b. Oral view of primary lesion in case shown in Fig. 4-a. Note ulceration involving left tongue and floor of mouth.



4-c. Postoperative oral view of case shown in Fig. 4-a, after left hemiglossectomy. Mandible was surgically fractured to gain access to floor of mouth resection. Mandible was then reduced and stabilized with buccal custom mandibular arch bar wired to remaining mandibular teeth.



4-d. Postoperative view of case shown in Fig. 4-a, following left radical neck dissection.

specialists, and demonstrable patient benefit in quality care has resulted. In cancer surgery or problems beyond the normal scope of the oral surgeon which involve his services to some degree, joint management is customarily practiced.

A full range of dental restorative care is provided by the general dental officer. A board-certified prosthetic officer on the dental staff generously contributes his assorted capabilities in customized prosthetic appliance fabrication. He routinely constructs fixed crown and bridge as well as removable denture appliances. This particular service can be provided to the Vietnamese patients only on a limited basis when the need is critical and resources are available. The prosthodontist also constructs more specialized cast custom arch bars and assorted appliances of metal or acrylic resin, usually upon the request of the oral surgeon. The prosthodontist has the capability of constructing soft alloplastic removable prosthetic appliances to replace facial parts including nose, eyes, cheek and ear. Such appliances are used where gross facial tissues have been lost and cannot be effectively or cosmetically replaced by reconstructive surgery.

Most patients arrive on the hospital ship by helicopter, but many also arrive by boat. The ship is normally anchored in DaNang Harbor six of seven days each week. During this anchorage, routine small craft boat service is normally provided between the ship and shore areas. Received patients may be referred from any of the American or Vietnamese hospitals, dispensaries, or battalion aid stations ashore. These are usually military facilities but civilian (provincial) hospitals may also contribute patients. The German Red Cross Hospital Ship Helgoland is another frequent source of new patients. The small staff of eight physicians on the HELGOLAND provide more generalized hospital care. Like SANCTUARY, HELGOLAND provides humanitarian medical services for the Vietnamese. Following initial evaluation, patients referred to the Naval Hospital in SANCTUARY are treated on an outpatient basis whenever possible. The majority of patients usually require hospital admission.

The need for maxillofacial type care is "especially" high among Vietnamese patients referred to SANCTUARY. Over the record period of the last ten months, Vietnamese "civilian" patients accounted for approximately 30% of all admissions to the oral surgery service. An additional 20% were Vietnamese "military" patients. Thus approximately one-half of all inpatients managed by the oral surgery service were Vietnamese.

Many special considerations are introduced in the treatment of maxillofacial conditions among the Vietnamese. The following discussion serves to identify



5. German Hospital Ship HELGOLAND

some of these potential problems.

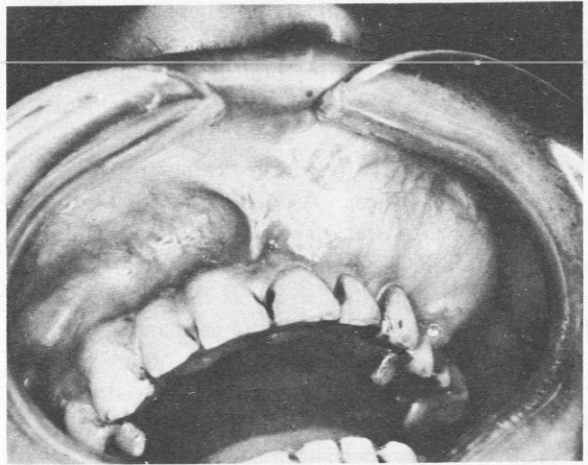
1. *Keloid formers:* A high percentage of Vietnamese appear to be keloid formers. The incidence rate is probably less than that encountered in the Negro population, but it is considerably higher than the Caucasian incidence rate. Skin grafts and soft tissue plastic work generally impose increased risk in this respect.

2. *Betel nut:* Many elderly Vietnamese, particularly females in rural populations, are habitual betel nut chewers. Many problems result from this, the most serious of which is the carcinogenic effect. The betel nut mixture usually includes a carefully concocted combination of areca nut and its leathery shell, slaked lime, shredded dried tobacco leaf, and finally the outer green betel leaf used to wrap the ingredients into a chewable size. Both the alkaline lime and the tobacco have been variously indicted as the principal carcinogenic agent. The betel nut cud is ordinarily held in the oral buccal vestibule area as its juices are squeezed out. It is in this buccal mucosa, as well as the floor of the mouth or lateral tongue margin, that the epidermoid carcinoma usually develops. In India where betel nut chewing is also popular, carcinoma of the buccal mucosa accounts for 15 to 40% of all malignancies. According to Bhaskar, oral carcinoma in many oriental countries accounts for 45% of all the cancerous growths. By comparison, epidermoid carcinoma is still the most common malignant oral tumor in the U.S., but it represents only about 7% of all malignancies.

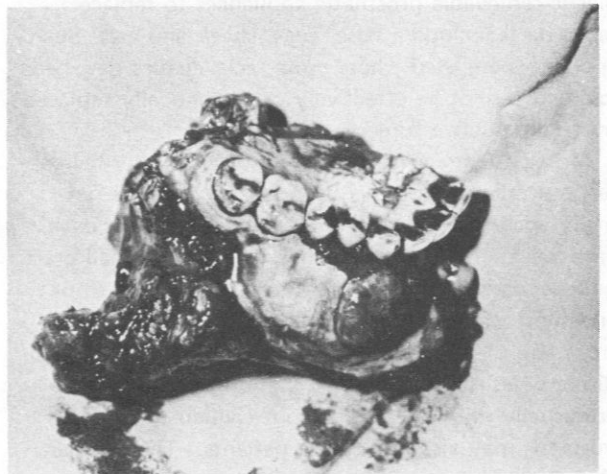
In Vietnam, epidermal carcinoma is customarily seen in older patients. Typically it is well-advanced when initially seen with metastatic cervical lymph nodes. One Vietnamese betel-nut-chewing female patient was only 30 years old, but had already developed more than 25 cervical metastatic nodes with a primary lingual carcinoma.



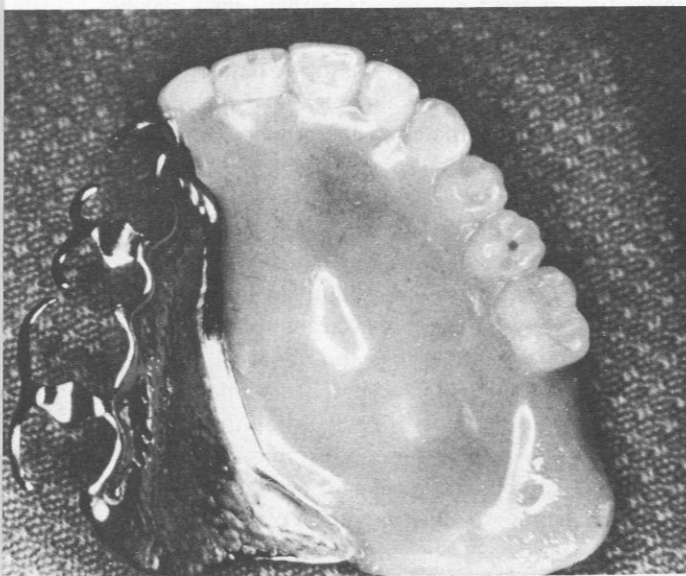
6-a. Preoperative facial view of 30-year-old ARVN member with recurrent chondrosarcoma of left maxilla.



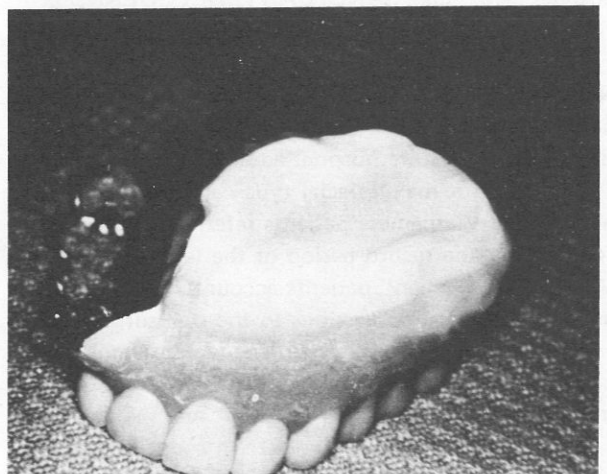
6-b. Preoperative oral view of case shown in Fig. 6-a. Note lesion bulging into left buccal vestibule.



6-c. Resected specimen including left maxilla of patient shown in Fig. 6-a.



6-d. Inferior view of fabricated maxillary partial denture prosthesis with obturator.



6-e. Superior view of fabricated maxillary partial denture prosthesis with obturator.

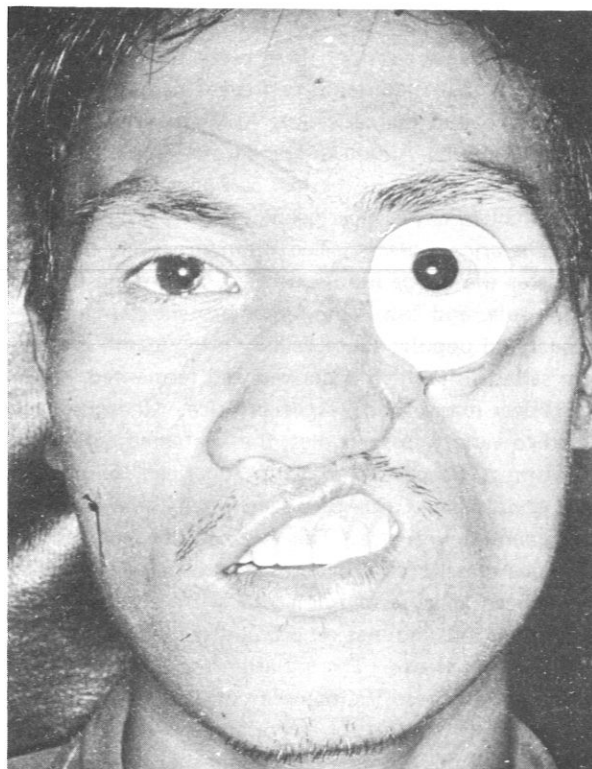


6-f. Postoperative view of patient shown in Fig. 6-a with denture prosthesis (Figs. 6-e and 6-f) in place.

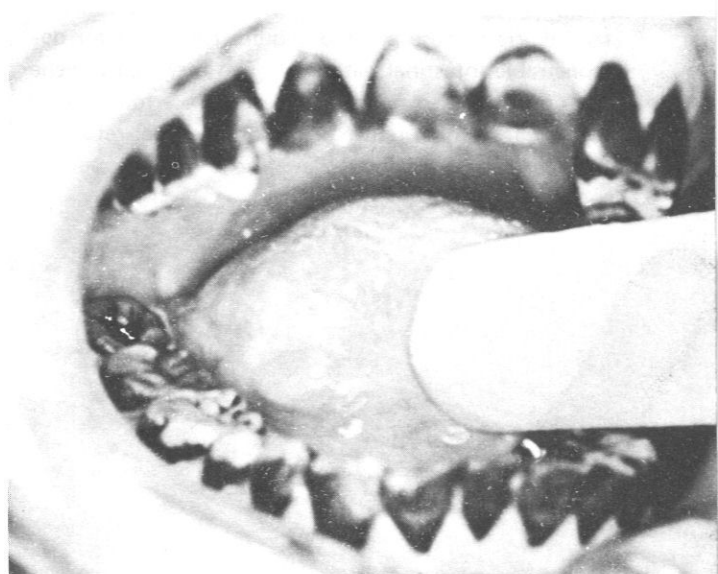
Betel nut chewing is highly habituating if not addictive, and may frequently impose an economic burden on many of its users. The average farmer probably spends more of his meager earnings to procure betel nut than he does for food. The lack of supply during their period of hospitalization is frequently a major complaint of betel nut users who present marked occlusal attrition of their dentition, especially posteriorly. This is no doubt related to the grinding aspect of chewing.

Many Vietnamese maxillofacial patients present fractures of the maxilla or mandible. The classical treatment of these fractures includes intermaxillary immobilization by means of elastic bands or wires. Such fixation prevents chewing and again frustrates the betel nut chewer. It is sometimes hard to convince even the non-betel nut chewer that mandibular immobilization is necessary and safe. Two elderly Vietnamese female patients recently treated on this ship presented unstable comminuted mandibular fractures requiring immobilization. In each case the fractures were sustained as the result of high velocity missile fragments from enemy fire. Neither patient could tolerate the confining jaw fixation despite continuous explanations and encouragement. Both patients repeatedly managed to remove elastics at first, and later, even wires, in order to free their unstable mandibles long before adequate healing was attained. Both patients eventually had to be discharged with incomplete treatment and presumptive nonunions.

Betel nut chewing also deposits a black stain on the teeth which is nearly impossible to remove. Some



6-g. Postoperative facial view of patient shown in Fig. 6-a with denture prosthesis in place and sialastic left orbital implant containing artificial eye.



7. Oral malignancy in 30-year-old Vietnamese betel nut chewer. Primary lesion is seen at right lateral margin of posterior tongue and teeth are stained from betel nut.

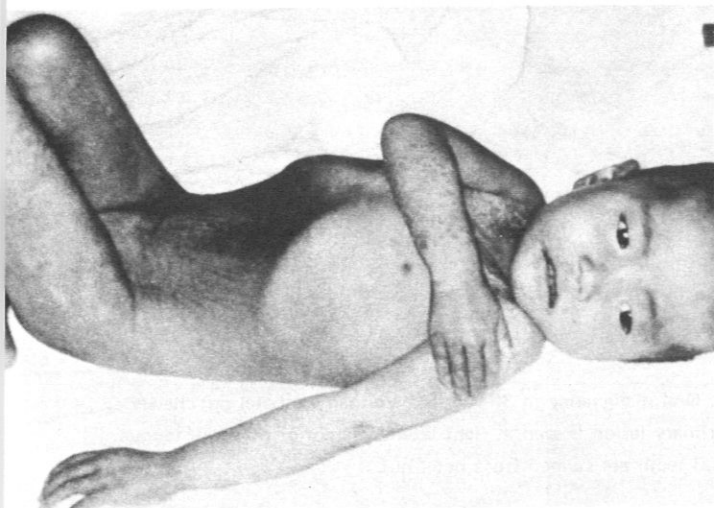
older Vietnamese consider these black teeth attractive and believe that such deposits prevent decay. It must be admitted that the caries rate in Vietnam is generally quite low by American standards. This is presumed to be related to the low carbohydrate diet rather than to any anticariogenic effect of betel nut.

3. *Dietary problems:* The Vietnamese rely heavily on rice as the major food source. Low protein diets are the rule, and fish is the major protein source. An unusual and popular sauce called "nuoc mam" is made from salted fish which is cooked and fermented. It is served over many foods, especially rice. Unaccustomed to variety in their diet, the Vietnamese patients find it most difficult to adapt to American food provided aboard SANCTUARY, even when the diet is well-supplemented with rice. This is especially true for numerous maxillofacial patients whose mandibles are immobilized because of fractures. With jaws "wired-shut", they must subsist on a liquid diet for a period of four to six weeks. The situation sometimes proves intolerable for these Vietnamese patients.

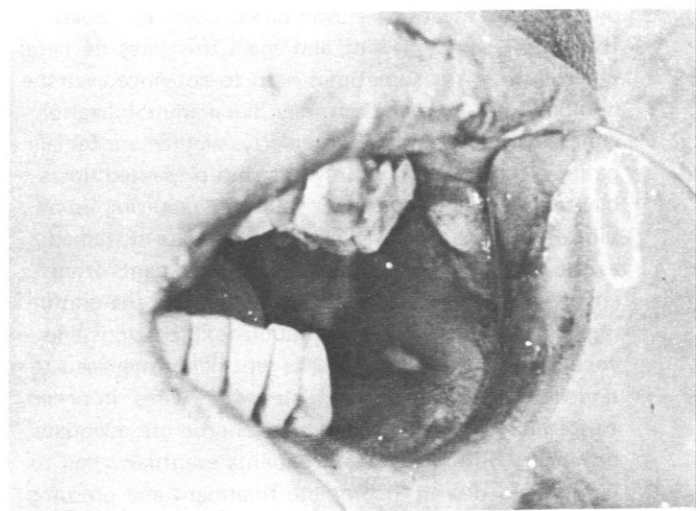
Preexistent malnutrition is common. Perhaps as many as 90% of Vietnamese patients share their diet with intestinal parasites, especially *Ascaris*, hookworm, and *Amoeba*. This is reflected in typical blood eosinophile counts of around 10%. One case of intestinal obstruction was presented by a young child who developed a mass of *Ascaris lumbricoides*. Most hospitalized Vietnamese patients require treatment for demonstrable intestinal parasites. The therapeutic benefit is probably temporary, however, since most patients will become reinfected upon eventual return to their former environment. Treatment is often associated

with vomiting, diarrhea, and malaise. Following the use of vermifugal agents such as piperazine citrate, the *Ascaris lumbricoides* may successfully escape the normal intestinal confines passing through the stomach and esophagus to the oral/nasal cavities or orifices. For these reasons, Vietnamese maxillofacial patients are not treated for parasitic infestation if they are essentially asymptomatic. If indicated, treatment is usually deferred until after mandibular immobilization can be released.

4. *Language barrier:* A perpetual problem in adequate communication exists between the monolingual Vietnamese patient and his English-speaking doctor, nurse, or corpsman. The American and the Vietnamese usually comprehend only a smattering of the other's tongue. One and sometimes two Vietnamese permanently serve on the ship as interpreters. Their services are invaluable and they are in nearly constant demand. Language interpretation problems still frequently arise, however, especially in medical terminology. Even two interpreters cannot be routinely available whenever rounds are made or communication with a particular Vietnamese patient is required. Compromise becomes necessary, especially in history taking and other marginally essential information. Both the doctor and patient become relatively adept at meaningful communication through facial expressions and hand language. The stoic noncommunicative type of patient presents a serious problem when he is also Vietnamese, however, for his language-imposed reticence may make it impossible to detect complications adequately. The level of consciousness or cerebration in head injury cases can be extremely difficult to assess in the Vietnamese patient.



8-a. Two-year-old, debilitated Vietnamese child with noma.



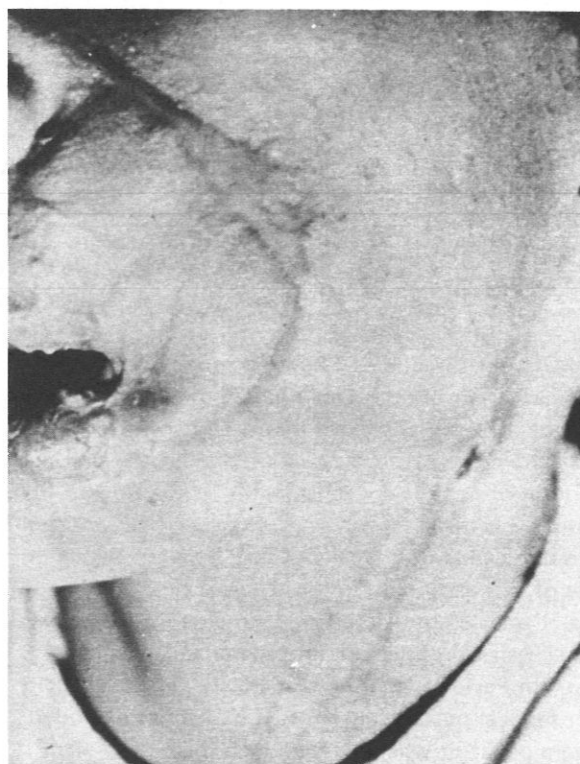
8-b. Oral view of child shown in Fig. 8-a.



9-a. Vietnamese civilian who required delayed reconstructive prosthetic and surgical care of old war injuries, with residual maxillofacial deformity and AK amputation of right leg.

5. *Inadequate domestic maxillofacial care:* Most Vietnamese members of the medical and dental professions are pressed into military service and their availability for civilian medical care is greatly curtailed. Vietnamese patients, especially the acute surgical types, are far more numerous and require much more extensive and urgent care than would be the case during a nonwar period. With the overburdened Vietnamese physicians, emergency war trauma must take first priority. Even in overcrowded provincial hospitals the prudent administrator attempts to maintain a reserve quota of empty beds for potential emergency or mass casualties. It is difficult for patients with apparently less urgent medical and surgical needs to procure care in the provincial hospitals.

Specialized maxillofacial care is often either unavailable, inappropriate, or inadequate by American standards. Mandibular and facial fractures frequently receive no reduction or fixation of any sort. Nonunion and malunion are common in patients with old injuries. Healing callus in nonimmobilized mandibular fractures grows to a much greater extent than in the immobilized fracture. This thick bulbous callus surrounding the fracture may sometimes be mistaken for abscess formation. Osteomyelitis is a more frequent complication in mandible fractures not immobilized.



9-b. Facial reconstruction area of patient shown in Fig. 9-a.

Dental arch bars are normally used by American-trained oral surgeons to facilitate jaw immobilization for facial fracture patients. Such arch bars have not been observed in any patients transferred from provincial Vietnamese facilities to the Naval Hospital in SANCTUARY. Arch bars are presumed to be unavailable to the domestic clinics and hospitals, or this treatment technique is not customarily practiced. A typical example was the case of a nine-year-old Vietnamese male patient who sustained a grossly comminuted fracture of the mandibular ramus as a result of a gunshot injury. Initial treatment elsewhere consisted of extra-oral open reduction of the fracture with multiple direct wiring of comminuted fragments. No postoperative mandibular immobilization was employed despite the relatively intact and complete dentition. A protracted course of osteomyelitis followed with nonunion. The ramus wires became loose and eventually had to be removed. During the nonunion phase, muscle pull collapsed the mandible into the fracture area. Eventually an effective bridging callus did form and a malunion developed. The mandibular shift altered the occlusion to an unfavorable functional relationship. At this point the patient was referred to the USS Sanctuary for correction of the occlusal problem.

(Continued on p.54)

THE GASTROENTEROLOGIST CORNER — AMMONIA INTOXICATION TO BE OR NOT TO BE

*By CDR Donald O. Castell, MC, USN; Gastroenterology Branch,
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"Methinks sometimes I have no more wit than a Christian or an ordinary man has: but I am a greater eater of beef and I believe that does harm to my wit". This statement, which may well represent the first description of hepatic encephalopathy in the English literature, was made by Sir Andrew Aguecheek, an irascible old alcoholic in Shakespeare's *Twelfth Night*. In spite of this early description by Shakespeare, however, it was not until the late 19th century that physicians began to recognize that such an entity might exist. In Pavlov's laboratory it was noted that dogs with surgical portacaval shunts (Eck fistula) exhibited bizarre behavior when eating a high meat diet. This "meat intoxication" syndrome has been well established over the ensuing years.

"Meat Intoxication" In Humans

During the next sixty years clinicians began to acquire an awareness of the possibility that the "meat intoxication" syndrome in the Eck fistula dogs might in some way be related to the occurrence of pre-coma and coma in patients with chronic liver disease, and that there may be some association of these phenomena with elevation of blood ammonia levels. In the early 1950's studies performed at the Boston City Hospital showed that hepatic pre-coma could be induced in cirrhotic patients by the oral ingestion of ammonia-containing compounds, including ammonium chloride, urea, and ammonium citrate¹. In addition, in these subjects, there was a reasonable correlation of the clinical phenomenon of pre-coma with elevations of the blood ammonia levels. Also in the early 50's studies from Sherlock's laboratories in London showed that protein ingestion in patients with cirrhosis could also produce central nervous system symptoms². Doctor Sherlock coined the term "portal-systemic encephalopathy" to describe this phenomenon. These significant

clinical observations resulted in an increasing awareness of the apparent interrelationship of protein ingestion and serum ammonia levels with the development of neurologic abnormalities in patients with cirrhosis of the liver. It is of interest that prior to this time the generally accepted therapy for patients with chronic liver disease was a high protein intake, and that the common clinical phenomenon seen in many patients with cirrhosis was a rapid deterioration in their condition once admitted to the hospital.

Importance of Ammonia from the Colon

The next important step in the development of an understanding of hepatic coma resulted in the clarification of the importance of the colon as a source of ammonia in the human. McDermott showed that in the normal fasting human subject, portal blood ammonia concentrations were four to five times greater than peripheral levels, and that even a greater ammonia gradient across the liver existed after meals³. This finding emphasized the importance of the urea cycle in the liver in "detoxifying" the ammonia presented in such high concentration in the portal blood, as shown in Figure 1. Studies at the Naval Hospital, Bethesda, Md. further documented the ability of the normal liver to rapidly eliminate a large load of ammonia from the portal circulation⁴. In addition, a relationship between poor ammonia tolerance and portal hypertension was established.

The source of the high portal venous ammonia level was elegantly shown by Phear and Ruebner to be directly related to the bacterial flora contained within the colon⁵. These investigators showed that when human feces were cultured in an amino acid media, there was significant ammonia production by almost all organisms normally contained within the human colon. In addition, all of these organisms were shown to produce even greater amounts of ammonia when urea was added to the media. Thus, the relative importance of bacterial proteases and urease in the production of

The opinions expressed herein are those of the author and cannot be construed as reflecting the views of the Navy Department or of the Naval Service at large.

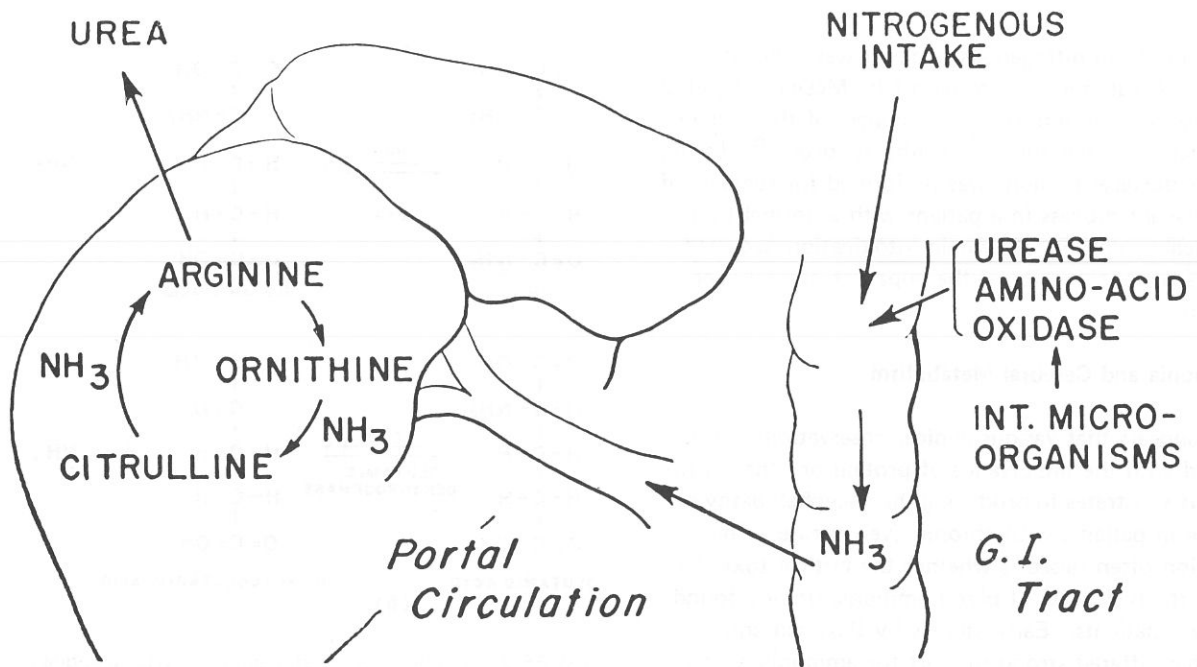


FIGURE 1. The relationship of ammonia (NH_3) production, by colonic bacterial enzymes, to removal of NH_3 from the portal blood by the hepatic urea cycle.

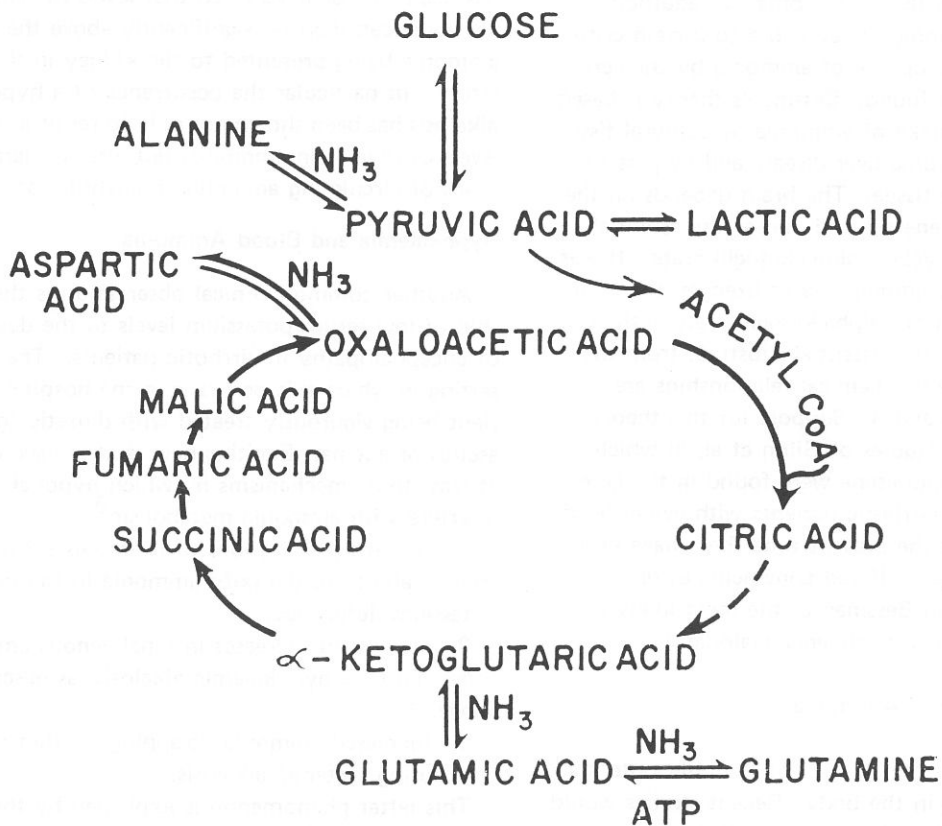


FIGURE 2. Representation of the Krebs metabolic cycle showing the theoretical depletion of alpha-ketoglutaric acid by ammonia (NH_3).

ammonia from nitrogenous material was well established. A subsequent case report by McDermott, et al, emphasized the importance of by-pass of the liver in production of the encephalopathy syndrome⁶. In this case a portacaval shunt was performed for removal of a malignant process in a patient with a normal liver. Classical symptoms of protein intoxication occurred in this patient in spite of the apparent normal liver function.

Ammonia and Cerebral Metabolism

It appears that various clinical observations are in accord with the importance of protein or other nitrogenous substrates in producing the encephalopathy syndrome in patients with chronic liver disease. The question often raised is whether the critical toxic factor is the high level of blood ammonia usually found in these patients. Early studies by Bessman and Bessman offered strong support for ammonia as the toxic agent, and allowed the formation of a theory which has yet to be disproven⁷. In these studies elevated blood ammonia levels were observed in patients with a variety of hepatic diseases, and showed rough correlation with the degree of coma. In addition, when the arterial ammonia level rose to certain critical levels, a definite uptake of ammonia by the cerebral tissue could be found. Bessman's theory is based on the apparent uptake of ammonia by cerebral tissue in patients with chronic liver disease and by-pass of functioning hepatic tissue. The brain depends on the Krebs cycle for its energy, and one of the essential substrates for this cycle is alpha-ketoglutarate. It was proposed that the ammonia was utilized by the brain to form glutamine from alpha-ketoglutarate with an overall depletion in this essential substrate from the Krebs cycle. These biochemical relationships are shown in Figures 2 and 3. Support for this theory was offered by the studies of Gilon et al, in which increased levels of glutamine were found in the cerebral spinal fluid of cirrhotic patients with evidence of hepatic coma⁸. At the present time there have been no studies which have offered convincing evidence against the theory of Bessman as the most likely explanation for portal-systemic encephalopathy.

Kidney as a Source of Ammonia

The human large intestine is not the only potential source of ammonia in the body. Recent studies would indicate that fairly significant ammonia production can occur from the kidney. The normal kidney has the ability to excrete considerable quantities of

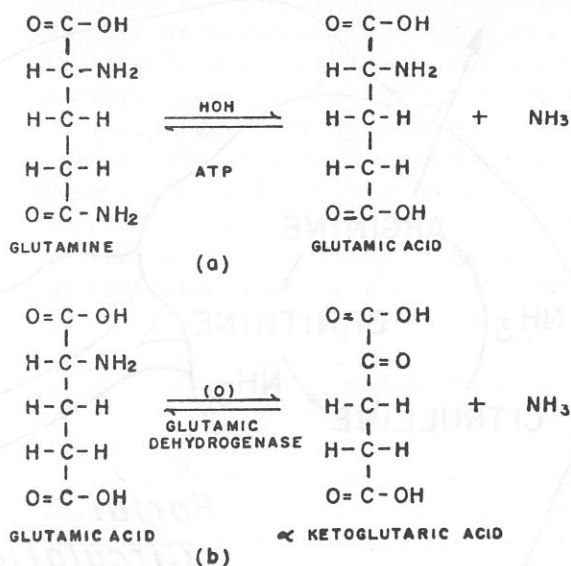


FIGURE 3. Reactions by which ammonia (NH_3) combines with alpha-ketoglutaric acid to form glutamic acid (b), and finally to form glutamine (a).

ammonia in the form of ammonium ion, as a mechanism to correct systemic acidosis. In alkalotic states it has been well demonstrated that levels of renal vein ammonia can increase significantly above the levels of ammonia being presented to the kidney in the renal artery. In particular the occurrence of a hypokalemic alkalosis has been shown not only to result in increased levels of renal vein ammonia, but also in increased levels of circulating ammonia in cirrhotic patients⁹.

Hypokalemia and Blood Ammonia

Another common clinical observation is the relationship of low serum potassium levels to the development of encephalopathy in cirrhotic patients. The usual setting in which this occurs is in the hospitalized patient being vigorously treated with diuretic agents for ascites or edema. Exciting new studies have clarified at least three mechanisms by which hypokalemia might interfere with ammonia metabolism⁹.

1. In vitro preparations of liver cells show a decreased ability to detoxify ammonia in the presence of potassium deficiency.

2. Significant increases in renal venous ammonia occur during a hypokalemic alkalosis, as described above.

3. Increased ammonia "trapping" within cells occurs during systemic alkalosis.

This latter phenomenon is explained by the fact that ammonia exists in the body in two forms: ammonium ion (NH_4^+) and free ammonia gas (NH_3). The former does not readily cross cell membranes;

whereas ammonia gas, being lipid soluble and nonionized, is freely diffusible. The dynamic equilibrium between these two forms of ammonia is defined by the equation, $\text{NH}_4^+ \rightleftharpoons \text{NH}_3 + \text{H}^+$, which is shifted to the right by increasing pH. Thus, with a systemic alkalosis, increasing quantities of free NH_3 are available to diffuse into brain cells. The relative intracellular acidosis resulting from the exchange of H^+ ions for K^+ ions within cells tends to "trap" ammonia in the form of ammonium ion. These relationships are illustrated in Figure 4.

The Hepatic Encephalopathy Syndrome

The above discussion details the important studies that have appeared over the past 20 years in our attempts to understand hepatic coma. Although there is often conflicting data on the absolute relationship of this syndrome and ammonia intoxication, the weight of evidence would strongly suggest that the most likely toxic factor in hepatic coma is the

ammonia presented to the cerebral tissues. This is stated very well by Conn in a recent review of the subject: "If the role of ammonia in the genesis of hepatic coma is not yet satisfactorily defined, there is no other theory that comes so near to conforming to the observed facts"¹⁰. On the basis of these important clinical studies we are able to formulate a rather simple, yet usually quite effective, approach to the patient with increasing central nervous system abnormalities and chronic liver disease. The cardinal features of hepatic encephalopathy include the following: 1) central nervous system derangement, 2) abnormal encephalogram (EEG), and 3) elevation of the serum ammonia levels. All of these features in themselves may not be diagnostic, or may, in fact, be individually nonspecific. The nervous system derangements include a change in level of consciousness ranging from drowsiness to frank coma, abnormal orientation of the patient often producing frank psychotic behavior, and finally the finding of asterixis, often seen as a classical "liver flap". It is important again to emphasize that none of these

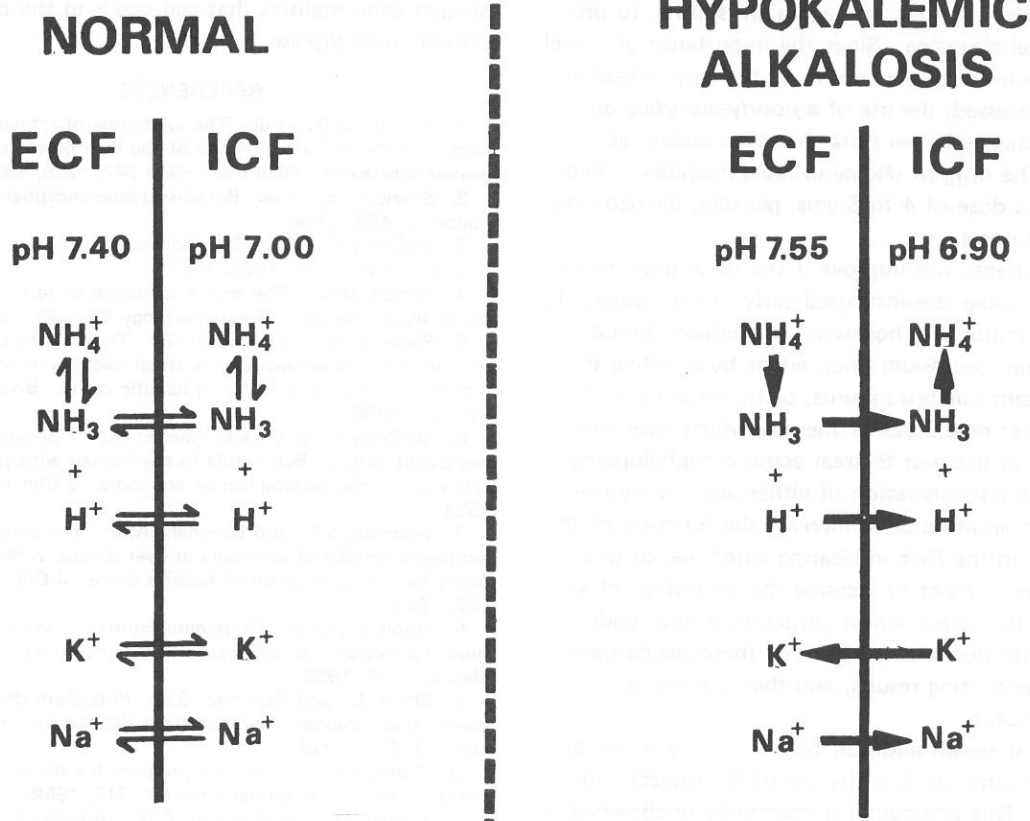


FIGURE 4. Dynamic equilibrium between ammonia (NH_3 and NH_4^+) and electrolytes in the extracellular fluid (ECF) and intracellular fluid (ICF) in the normal state and during hypokalemic alkalosis. In the latter state, with K^+ depletion there is a shift of K^+ from ICF to ECF, and a resulting transfer of H^+ and Na^+ in the opposite direction. The resulting ECF alkalosis and ICF acidosis producing an overall "trapping" of ammonia within the cells in the form of NH_4^+ .

findings are diagnostic of hepatic encephalopathy, but can occur in a variety of other metabolic intoxications. Similarly the EEG abnormality, a diffuse slowing in the frequency of the brain waves to less than 8 waves per sec., is also nonspecific and can be seen in other metabolic defects. Finally, the serum ammonia level is difficult to obtain in most laboratories. Until a better laboratory determination is available, it is usually of little help to the practicing physician.

Therapy of Hepatic Encephalopathy

As stated above, the treatment of this condition is quite clearly and simply based on the information known about its apparent pathogenesis. The mainstay of therapy for hepatic encephalopathy is to *remove protein* from the diet. All protein should be eliminated when the first signs of encephalopathy appear, and then progressively replaced as clinical symptomatology improves. Coincidental with elimination of protein from the diet, it is important to attempt to *clean the GI tract* of protein-containing material. Therefore, most clinicians would initially add a cathartic preparation, such as magnesium sulfate, to promote bowel cleansing. Since the importance of bowel bacteria in producing ammonia in the large intestine has been stressed, the use of a *poorly-absorbed antibiotic* to change bowel flora, has been widely accepted. The drug of choice in most hospitals is neomycin, at a dose of 4 to 8 gms. per day, divided into four equal doses.

Most patients will improve if the three basic measures listed above are instituted early in the course. It is equally important, however, to maintain the patient's serum potassium level, either by avoiding the use of potent kaliuretic agents, or by replacing potassium. Other modalities of therapy which have been advocated in the past to treat acute encephalopathy include the administration of either arginine hydrochloride in an attempt to increase the function of the urea cycle in the liver in clearing ammonia, or glutamate, in an attempt to increase the utilization of ammonia by the formation of glutamine within body cells. Controlled trials of both of these agents have given disappointing results, and they are not widely used at present.

The most recent addition to the therapy of hepatic encephalopathy involves the use of the disaccharide lactulose. This compound is essentially unabsorbed in the human small intestine and passes into the colon where bacterial action results in fermentation with the production of lactic acid and carbon dioxide. The major effect would appear to be a lowering of the

intraluminal pH in the colon, thus interfering with the actual absorption of ammonia from this organ¹¹. Early clinical trials have indicated that lactulose may be quite effective in the treatment of chronic hepatic encephalopathy¹².

Conclusion

It is important to again emphasize that there are occasional discrepancies in the apparent relationship of hepatic encephalopathy to measured serum ammonia levels. Such observations often raise the question of whether ammonia is the primary intoxicating agent. The weight of evidence certainly incriminates nitrogen-containing substances, particularly protein, in the production of this syndrome. The frequent response of patients to the removal of protein from the diet tends to confirm the importance of these substances in producing coma in cirrhotic patients. A variety of names have been given to this particular abnormality including the "one-meatball syndrome". The pathogenetically descriptive term *portal-systemic encephalopathy* probably best describes the full range of central nervous system abnormalities that can occur in the patient with chronic liver disease.

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GLAUCOMA AND FLYING*

By CDR Fred S. Evans, MC, USN; Chief, Ophthalmology Division,
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Glaucoma simplex is an insidious, asymptomatic disease of the eyes which if left untreated will result in permanent blindness. It occurs in approximately two percent of people over age 40 years.

Since glaucoma simplex cannot be cured, treatment with topical drugs continues for life and is fraught with numerous undesirable side effects. It is most important that all diagnostic tests possible be used in an effort to determine when treatment is really necessary. Some naval aviators become NPQ (Not Physically Qualified) for aviation after beginning treatment due to undesirable side effects; most however, can be placed either in Service Group II or III, and continue flying.

Although this paper deals primarily with glaucoma simplex, one should be familiar with other types of glaucomas. Below is a simple classification.

1. Congenital glaucoma — present at birth or shortly thereafter. Incidence — rare. Caused by mechanical blockage of the anterior chamber angle by a mesodermal remnant. Treatment is surgical.

2. Acute congestive glaucoma (narrow angle glaucoma**) — caused by the iris mechanically blocking the anterior chamber angle. Seen in hyperopic presbyopic people. Most common in the "short fat female" who is hyperopic. Usually precipitated by slight dilation of the pupil which occurs in darkness as in the theater or at night. Presents as a unilateral red, painful eye with a semi-dilated pupil and with an intraocular pressure (IOP) of 50 mm Hg or more; it is associated with frontal headache, neausea, and vomiting. Treatment consists of miotics to clear the angle, then surgery (peripheral iridectomy) at a later date.

*CDR Evans spoke on Glaucoma and Flying at the 41st Annual Scientific Meeting of the Aerospace Medical Association, St. Louis, Mo. This paper was prepared at the request of U. S. Navy Medicine and is intended for the practicing flight surgeon, aviation medical examiner, and others who are interested in aviation medicine. Its purpose is to present basic facts about glaucoma simplex. It is written with practicality in mind, and is not intended to give a comprehensive discussion of the glaucomas.

**This is the type glaucoma that could be provoked by parasympatholytic drugs which cause slight dilation of the pupil, such as those used in peptic ulcer disease and depressive reactions. A quick slit lamp examination of the anterior chamber easily determines whether or not these drugs should be used.

3. Secondary glaucoma — secondary to other ocular disease such as iritis, trauma, hemorrhage, etc. Treat the primary disease and this usually controls the glaucoma.

All of the above are fairly infrequent as compared to glaucoma simplex.

Physiology of the Aqueous Humor — The aqueous is produced by the epithelium of the ciliary processes of the ciliary body. It then flows through the pupil into the anterior chamber and through the trabecular meshwork (in the anterior chamber angle) to the Canal of Schlemm. Normally, the resistance of the trabecular meshwork to the aqueous is such that an IOP of 13 to 18 mm Hg is maintained. With aging it is thought that the collagenous fibers composing the trabecular meshwork change in some way, causing more resistance to the aqueous, thus the IOP must rise in order for the aqueous to flow through the meshwork to the Canal of Schlemm. This is the theory of the pathogenesis of glaucoma simplex. It is known that glaucoma simplex has familial tendencies, but it is not known why people without positive family histories develop glaucoma and some do not. Since it is rare for this condition to occur before age 40 years, tonometry is recommended annually for all people age 40 or over. Of course, if there is any reason to suspect the disease at an earlier age, tonometry should be done.

Pathophysiology of Glaucoma Simplex — With a sustained elevated IOP the weakest portion of the globe yields. The lamina cribosa (portion of the sclera through which the optic nerve passes) is the thinnest portion of sclera and it is this portion which suffers damage. Since the optic nerve is encompassed in this area it also suffers damage by being displaced posteriorly (cupped or bowed). It is thought that an ischemic insult of the small arterioles supplying the optic disc is what really causes the death or damage of the optic nerve fibers. The changes are irreversible, and visual field defects go "hand and hand" with the appearance of the optic disc. In very early damage, typical visual field defects may sometimes be found before any appreciable change in the optic disc is noted. This is

why the visual fields are so important in diagnosing early cases of glaucoma simplex.

Normal IOP: 13-18 mm Hg

Suspicious IOP: 19-23 mm Hg

Abnormally high IOP: 24 mm Hg and above

Methods of Determining Intraocular Pressure (IOP)

1. Ballotement — using the fingers to palpate the globe. Inaccurate; indicates only if an eye is very hard or very soft.

2. Schiøtz' tonometer — fairly accurate, simple to use, inexpensive. Requires topical anesthesia; make certain that the examiner's fingers do not give a false high pressure by exerting pressure on the patient's eyelids. Best all-around tonometer.

3. Applanation tonometer — most accurate; attaches to the slit lamp. Requires topical anesthesia; used by ophthalmologists to follow known glaucoma cases and suspicious cases.

Suggested Routine When an Elevated or Suspicious IOP is Found

If one finds an IOP in the low 20 mm Hg, repeat tonometry on other visits is indicated. The normal IOP fluctuates giving a diurnal curve with expected highest IOP near midnight, so it would behoove one to take the patient's IOP in the A.M., midday, and early evening P.M. If an elevated IOP is found on several occasions further testing is indicated. Usually this should be done by an ophthalmologist or by a medical officer with special interest in ophthalmology. There is no emergency in having these "borderline" tensions seen by an ophthalmologist, as it is very rare for an IOP of 25 mm Hg or less to cause damage, unless it is of longstanding duration. It is also recommended that no one be started on treatment for glaucoma without a thorough evaluation by a physician interested in glaucoma, since the drops used, whether mydriatic or miotic, cause some disturbances of the visual acuity. The drops also interfere with a good "baseline" study of the eye.

Studies for a "Glaucoma Suspect"

1. Measure IOP with applanation tonometer on several occasions.

2. Careful funduscopic exam of the optic discs to rule out glaucomatous cupping.

3. Visual fields; both central and peripheral.

4. Grant's tonography — both dehydrated and after water loading. This test is the most dynamic for actually determining how the eye can handle increased amounts of aqueous. From this graphic tracing, one

can predict whether or not the patient will have, or has at the present, a significant embarrassment to the outflow of the aqueous.

5. Gonioscopic exam of the anterior chamber angle.

Rationale of Treating Glaucoma Simplex

One should never treat an elevated IOP alone. Some eyes can "take" an IOP of 25-28 mm Hg for years without any damage occurring. Other eyes sustain damage after a few months with the same pressure. Therefore, if we can follow a patient with an elevated IOP at three monthly intervals, and can demonstrate no damage as manifested by healthy, non-changing optic discs and normal visual fields, the tendency is not to treat these patients. Since all of our flight personnel are very cooperative in keeping their follow-up appointments, we are able to keep them visually healthy and prevent the annoying side effects of treatment. Employing the same rationale, we all have patients with elevated IOP who either cannot, or will not, return to be followed frequently, and are therefore not treated.

When Should an Elevated IOP be Treated

Every case has to be individualized, but in general, treatment should be instituted in patients who:

a. Have been maintaining a fairly consistent elevated IOP without evidence of damage, and then show a rise of the IOP of five mm Hg or more,

b. When typical glaucomatous field defects are found even though the optic discs appear healthy,

c. When the optic discs show increased cupping, with or without visual field defects (these defects are usually present, but occasionally cannot be demonstrated).

Treatment of Glaucoma Simplex

All treatments are aimed at reducing the IOP, by either reducing the amount of aqueous formed and/or by decreasing the resistance to the outflow of the aqueous.

1. Epinephrine-like drugs (levo-epinephrine 1-2%) — this is usually the first treatment for glaucoma as it has fewer side effects. It should be instilled into the eye b.i.d. It works in some unknown manner to decrease the amount of aqueous produced as well as improve the outflow. Disadvantages are slight mydriasis, and if absorption throughout the nasal mucosa occurs, nervousness, tachycardia, tremors, headache, and possible slight rise in blood pressure. (These sympathetic symptoms can be prevented by having the person occlude the puncta with his finger for 30 seconds immediately after instilling the drop.)

2. Miotics — these agents could better be termed *cyclotonics*. Although they all cause tremendous miosis, their benefit results from the spasm of the ciliary body which causes tension on the scleral spur (in the anterior chamber angle) and thus "opens up" the trabecular meshwork so that it offers less resistance to the aqueous. These drugs are usually used when epinephrine-like drugs cease to be effective, and may be used in conjunction with them.

Disadvantages: *Miosis* — causes slower and incomplete dark adaptation. Interferes with visual acuity if small central lenticular opacities are present. *Cyclo-tonia* — causes varying refractive errors, tending to make one maximally myopic shortly after instillation, then less and less as the "tonia" decreases. Several pairs of glasses may be necessary to maintain 20/20 vision during this entire period. Frontal headaches of mild to moderate intensity occur during the initial treatment period. These drugs are instilled two to four times a day in the case of the weaker ones such as pilocarpine; the anticholinesterase drugs may be used only once in 24 hours.

Examples: pilocarpine, carbachol, eserine, isoflurophate, echothiophate, and demecarium.

3. Carbonic anhydrase inhibitors — reduce the amount of aqueous formed. Given in tablet form, one to four a day, in conjunction with miotics when miotics and epinephrine-like drugs will not control the IOP. These drugs are a sulfur analog and sensitivity should be ruled out. Examples: acetazolamide, methazolamide, dichlorphenamide, and ethoxzolamide. Side effects: these are not present in all cases but are fairly common. GI upsets such as nausea, vomiting and diarrhea; trembling and paresthesia; drug allergy.

Current Military Regs of Aviators With Glaucoma

1. The U.S. Navy normally allows aviators who have glaucoma simplex controlled by topical medication to continue to fly if the examining flight surgeon states that they are otherwise physically qualified for a given Service Group, and can safely perform their duties. At the present time most all aviators who are

using miotics are in Service Group III, because of age. It would be wise for Naval Flight Surgeons to carefully consider the risks before allowing a naval aviator to remain in Service Group I while on miotics; the main hazard presented occurs during carrier landings, especially at night.

Definition of different Medical Service Groups as they apply to Naval Aviators:

Service Group I — Aviators in this category may be assigned flight duties of an unlimited or unrestricted nature.

Service Group II — Aviators in this category may be assigned flight duties similar to Service Group I, with the exception that they are restricted from carrier flight operations, except in helicopters.

Service Group III — Aviators in this category operate only dual control equipped aircraft and must be accompanied by a pilot or copilot of Service Groups I or II qualified in the specific type aircraft.

2. The U.S. Air Force and the U.S. Army are more strict than the Navy. If an aviator has glaucoma, they will allow only those on epinephrine-like drops to fly in control of the aircraft. They do not have different Service Groups and they feel miotics have too many adverse side effects to allow non-restricted flying.

3. The FAA allows airmen of all type ratings to fly on any medication. They do restrict night flying for ATR's who are on miotics.

Summary

Glaucoma simplex occurs frequently enough to warrant tonometry in people 40 years of age and older. One should not treat an elevated IOP alone, but should obtain additional information by performing careful tests repeated at regular intervals. Once the diagnosis of glaucoma simplex is made, one should realize that treatment will probably be continued for life, and visual handicaps secondary to treatment are common. ☞

(Continued from p. 49)

The P&T Committee is the appropriate command instrument of evaluation, education, and control. The Committee's most visible product, the formulary, is probably the best evidence of its degree of success. The formulary, however, does not indicate how well the P&T Committee communicates with the staff. Principle objectives of the Committee should include: scientific evaluation of each item considered for the

formulary; ensuring that the staff is informed on the reasons for Committee actions taken, and; provision of continual guidance, advice and assistance to the staff in all matters relating to drug therapy.

Successful completion of this program depends upon participation at all organizational levels by all responsible individuals and activities. Hopefully, this information will stimulate that participation. ☞

OTALGIA: ITS DIFFERENTIAL DIAGNOSIS

By LT A. K. Yung, MC, USN, and LCDR R. J. Kramer, MC, USN, Department of Otolaryngology, Naval Hospital San Diego, Calif.

Statistical and Anatomical Review

A presenting symptom of pain in the ear is one which requires a complete otolaryngologic examination during the course of its investigation. In our experience with approximately 25,000 outpatient visits a year, otalgia represents a most perplexing and time consuming problem. Our approach to these patients is based on the regional anatomy and the overlapping sensory distribution, as well as the neurophysiologic phenomena of referred pain.

The opinions or assertions contained herein are those of the authors and are not to be construed as official or as reflecting the views of the Navy Department.

Sensory fibers to the external ear are derived from: (1) the mandibular division of the fifth cranial nerve (auriculotemporal); (2) the posterior auricular branch of the seventh cranial nerve; (3) the auricular branch of the ninth cranial nerve; (4) a branch of the tenth cranial nerve, Arnold's nerve, which is joined by (2) and (3) before their distal distribution to respective areas of innervation, and; (5) greater auricular and lesser occipital nerves from cervical nerves C2 and C3.

The middle ear innervation is mainly derived from the tympanic plexus which is formed by the tympanic branch of the ninth cranial nerve (Jacobson's nerve). The facial nerve also contributes to the plexus which lies on the promontory deep to the mucosa. No pain fibers have been defined in the inner ear. Specific areas of aural innervation are presented in Table I.

Table I. Aural Innervation

Nerve	External Ear	External Canal	TM	Middle Ear	Auditory Tube
V	Anteriorly the superior portion Tragus	Anterior & superior walls	Anterior & superior portions		50% incidence
VII	Anteriorly the concha Posteriorly the central medial area Part of mastoid	Posterior & inferior walls	Posterior & inferior surfaces	May contribute to Tympanic Plexus	
IX	Same as VII with Lateral & inferior portions	Same as VII	Entire internal surface	Entire middle ear mucosa	Entire mucosal surface
X	Same as IX	Same as IX	Same as IX		
C2-3	Posterior surface including mastoid area				

Table II. Common Sources of Referred Pain

V	VII	IX & X	X	C2-3
Lesions of the nose and sinuses	Vidian neuralgia	Acute pharyngitis and tonsillitis	Angina pectoris	Cervical disc lesions
Sphenopalatine neuralgia		Peritonsillar abscess	Hiatus hernia	Arthritis of the cervical spine
TM joint		Parapharyngeal and retro-pharyngeal abscess		Fibrositis and myositis of the upper part of the sternocleidomastoid muscle
Dental caries		Tonsillectomy		
Impaction of the molar teeth		Nasopharyngeal & hypopharyngeal tumors		
Apical abscess		Ulcerations and neoplasms of the tongue		
Infection & salivary calculi		Ulcerations and tumors of the larynx		
		Elongated styloid process		
		Glosso-pharyngeal neuralgia		

The distribution of the general sensory afferent and special sensory afferent nerve fibers covers areas of the face, neck, oral cavity, pharyngeal lining and gastrointestinal tract, and the heart. Referred pain can theoretically originate from any one small area innervated.

Table II lists the more common sources of referred pain reported in the literature. The most common sites of origin of referred pain are dental, pharyngeal, tonsillar and the temporomandibular joint.

Case Reports

Case No. 1:

G.D., a 63-year-old female, presented with a six months' history of right-sided ear pain. Repeated otologic examination failed to reveal any apparent cause. A clinical diagnosis of glossopharyngeal neuralgia was made initially but the patient failed to improve with appropriate treatment. Finally a small ulceration was noted at the right base of the tongue on reexamination. Biopsy of the lesion established the diagnosis of squamous cell carcinoma.

Case No. 2:

K.R., a 55-year-old male, presented right-sided otalgia of four months' duration. The pain was intermittent and dull in character. Otologic examination revealed nothing to account for the symptomatology. However, detailed examination of the head and neck revealed edema of the left arytenoid cartilage and superficial ulceration of the left aryepiglottic fold.

Biopsy led to the diagnosis of squamous cell carcinoma.

Case No. 3:

G.M., a 31-year-old male, was admitted initially for a complete workup because of right retro-ocular pain and otalgia. These localized pains were moderate in severity and occurred at various times of each day for the previous six years. Associated symptoms were right shoulder and neck pain, and occasional excessive lacrimation. There was no history of injury. Complete neurological and ophthalmological examination followed by appropriate studies including EEG, brain scan and pneumoencephalogram, revealed no abnormalities. ENT examination revealed a bony spur at the right aspect of the nasal septum, impinging on the middle turbinate. Careful cocaineization of the particular area produced complete relief of earache, eye pain, shoulder pain and neck pain. A septoplasty was performed, and the patient has subsequently remained asymptomatic.

Summary

Three cases are presented to illustrate the common pitfalls to be avoided in managing a patient with 'pain in the ear'. Careful reexaminations by a number of physicians, and close follow-up care, have proven to be the most effective diagnostic tools.

Discussion

Otalgia, the subjective symptom of pain in the ear,

can present an exceedingly difficult problem for the busy otolaryngologist. All too often he is tempted to perform a superficial examination and prescribe an analgesic.

A thorough, systematic examination of the head and neck is vital to the detection of serious underlying pathology, as was demonstrated by the first two cases presented above.

The differential diagnosis of otalgia is a difficult one, especially when it involves a patient within the fourth to sixth decade of life associated with a high index of suspicion for malignancy. Every effort must be made to establish the proper diagnosis and treat the problem appropriately.

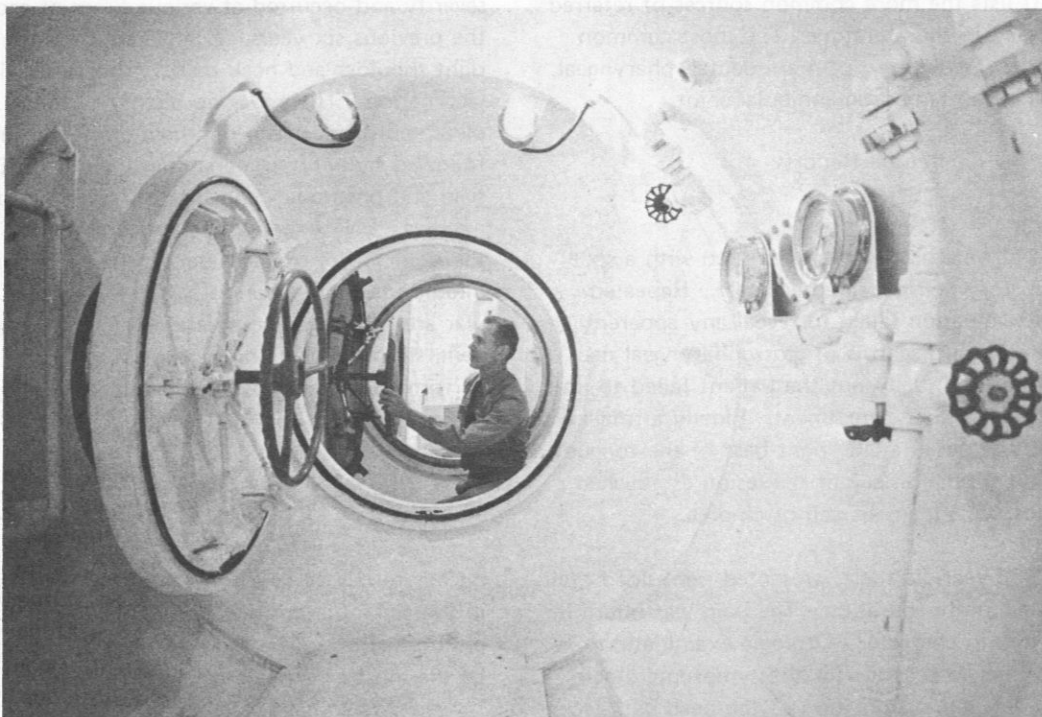
The chronological order of examination should be planned and executed so that the most obvious causes, such as otitis, should be sought and confirmed last. If the etiology remains obscure after a thorough examination, ancillary studies should be conducted such as X-ray examinations of the temporomandibular joint and paranasal sinuses, and cervical esophagogram.

Reexamination by the same physician has proven to be our most reliable diagnostic tool. Should this prove unrewarding, an intra-departmental, and then inter-departmental referral may be helpful. There are times when a very slight departure from normal can totally elude the primary physician.

Editorial Note: A frequent complaint voiced by those involved in clinical services, both patients and physicians alike, is that the opportunity for medical follow-up by the same physician is often destroyed, sometimes needlessly. The authors of the foregoing article add an objective plea for providing a system of health care that allows for reexamination of patients by the previous examiners, wherever possible.

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Being readied for recommissioning in 1966, SANCTUARY's Recompression Chamber was checked by HMC J.E. Novak, USN. (Courtesy of HMC R.M. Johnsen, USN).

THE MEDICAL SUPPLY SYSTEM AND FIELD BRANCH, BUREAU OF MEDICINE AND SURGERY: 120 YEARS OF SERVICE

*By CAPT Solomon C. Pflag, MSC, USN, Chief,
Field Branch BUMED, Philadelphia, Pa.*

History

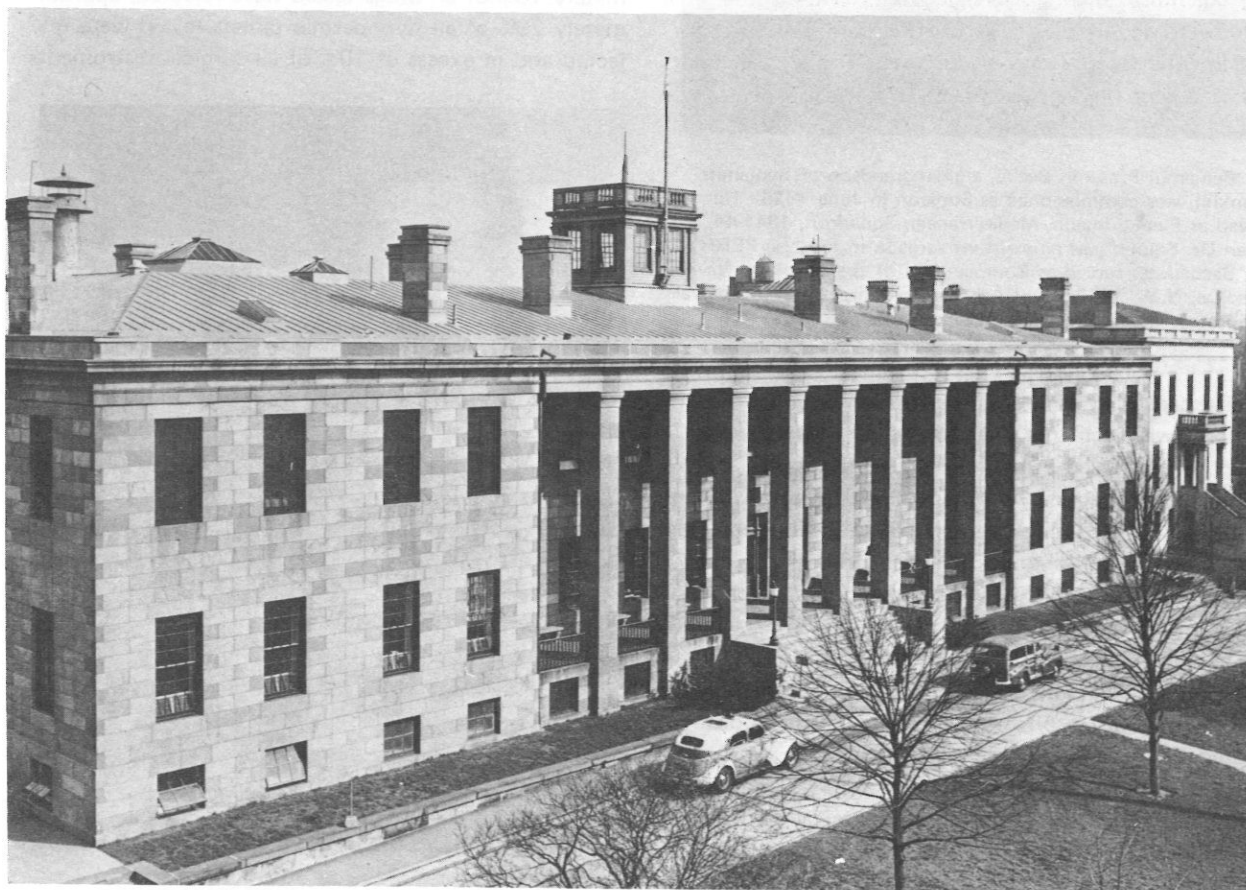
The precursor of the present Field Branch, BUMED, was the U.S. Naval Medical Supply Depot, Brooklyn, New York which was established in about the year 1850, in a room of the Brooklyn Naval Hospital. With austere equipment the manufacture and processing of a few medicaments, used primarily at the hospital, was begun. Substantial progress soon warranted expansion of the project to permit the manufacture of additional medicinal preparations for the newer hospitals, which were subsequently established to serve the requirements of a growing Navy.

In 1853 an Act of Congress authorized the Navy Department to build and equip a laboratory in which

medicines could be made for the use of the Medical Department of the Navy. Such a laboratory was built on land belonging to the Brooklyn Naval Hospital. The success of the laboratory was evidenced by the growing demand for its medicaments with their reputation for high quality.

It was in this laboratory that the production of ether, utilizing steam heat, was developed and averted the danger presented by the utilization of other methods. It was here that Dr. Squibb achieved a production breakthrough which later was to form the basis for the establishment of E.R. Squibb and Company, one of the largest pharmaceutical companies in this country.

Following the termination of the Civil War, the



Naval Hospital Brooklyn, N.Y. On the second floor above the isolation ward, in the right corner of the original building, a one-room laboratory to manufacture medicines (the early beginning of the Naval Medical Supply Depot), was set up by Passed Assistant Surgeon E. R. Squibb under Surgeon B. F. Bache in the early 1850's.



Dr. Benjamin Franklin Bache, a great-grandson of Benjamin Franklin, was commissioned as Surgeon in June 1828. He served as Fleet-Surgeon, Mediterranean Squadron, 1841-44, when Dr. Squibb was an assistant surgeon in the brig PERRY. Dr. Bache later served as Commandant of the Brooklyn Naval Hospital, N.Y., 1850-54, and as the first Director of the Naval Laboratory at the Brooklyn Naval Hospital, 1855-72.

civilian capability for commercial production of medicaments was such that pharmaceutical preparations could be purchased in sufficient quantity and quality to obviate the necessity for competition with a Navy laboratory in preparing these substances. Thus the role of the Naval Laboratory shifted primarily to the manufacture and equipment of "boat boxes, fracture boxes, medicine chests, packing cases, etc."

The Secretary of the Navy in 1905 authorized the construction of a new building on the grounds of the Brooklyn Naval Hospital and directed that it be designated "The U.S. Naval Supply Depot". In addition to its function of procuring, storing and issuing medical material, it had a physical and chemical testing capability as well as a repackaging capability for pharmaceuticals; and it is interesting to note that at that time whiskey and wine were received in barrels and were rebottled to fill requisitions.

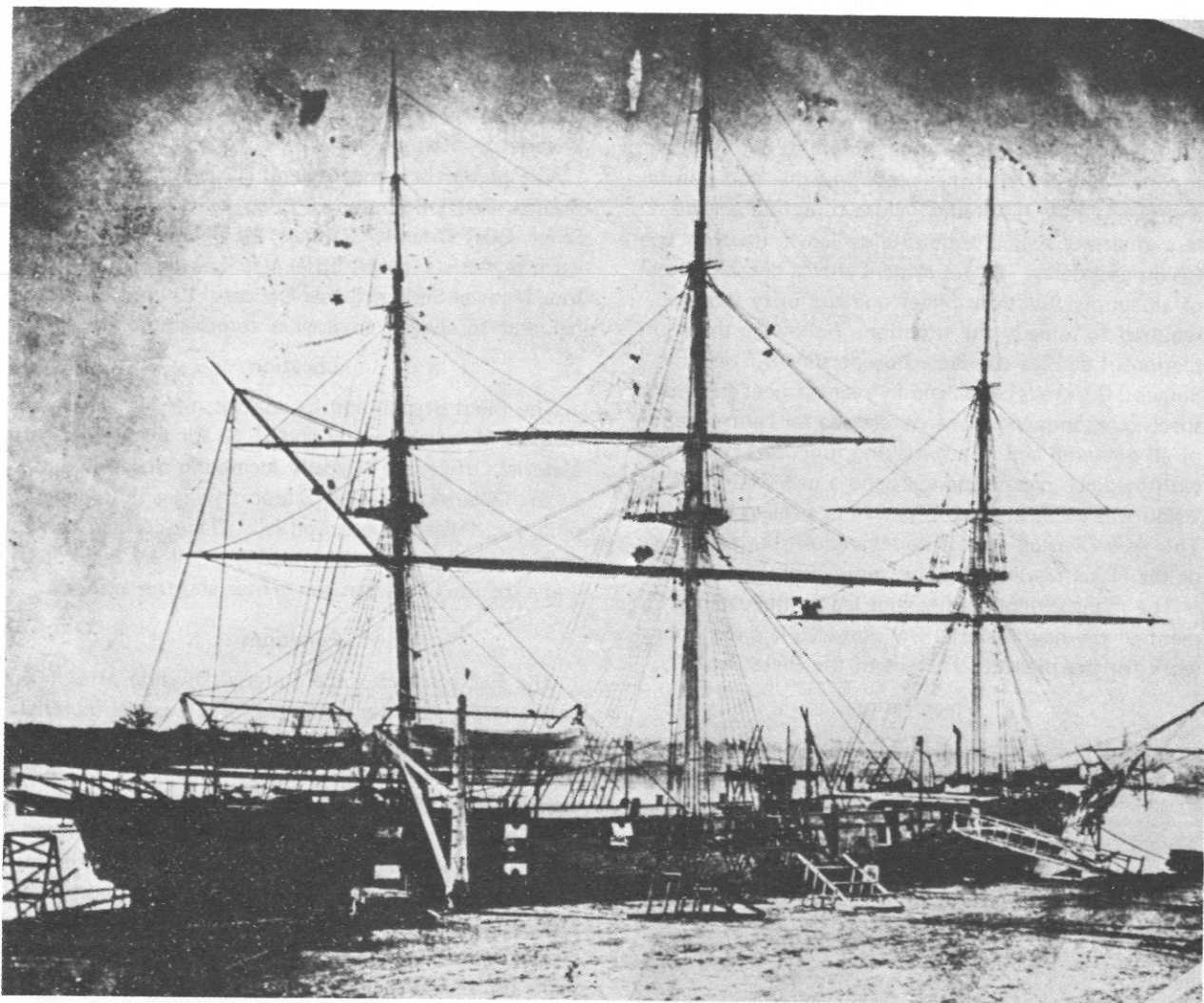
There is very little in the early history which would

accurately define personnel strengths of the antecedents of the current Field Branch; however, in 1917 personnel of the Depot consisted of a Medical Inspector who functioned as a Commanding Officer, 2 Pharmacists, 7 Hospital Corpsmen and 13 civilian employees. In 1944, this modest staff had grown to include a Medical Corps Rear Admiral who functioned as Commanding Officer, 11 Medical Officers, 4 Dental Officers, 48 Hospital Corps Officers, 2 Supply Officers, 94 Hospital Corpsmen and 608 civilian employees, a total of 768 personnel. That year the efficiency of the Depot was greatly enhanced by the establishment of modern laboratory facilities and the addition of personnel with strong technical backgrounds and national reputations.

Inasmuch as medicaments had in the past been accepted utilizing such unscientific testing methods as physical appearance and organoleptic testing, a new program was instituted which required that drugs comply with Official Compendia Standards such as those delineated in the USP. It is interesting to note that in the first half of 1917 the following items were tested and the following rejections were recorded: approximately 10% of all drugs tested were rejected, approximately 23% of all hypodermic tablets tested were rejected and in excess of 10% of all surgical instruments



Passed Assistant Surgeon Edward R. Squibb was the Assistant Director of the Naval Medical Supply Depot at the Brooklyn Navy Yard, N.Y. He resigned from the Navy in December 1857. (Photo by courtesy of E.R. Squibb & Sons, Inc.)



The brig PERRY is shown tied up at the Brooklyn Navy Yard. Following appointment in 1847, Dr. Squibb served as an assistant surgeon in PERRY under Fleet Surgeon Bache. The two physicians conversed and agreed on the need to improve methods of procuring drugs in the Navy. (Photo by courtesy of E.R. Squibb & Sons, Inc.)

tested were rejected as were surgeons' accessories and rubber goods. A striking contrast can be drawn by comparing these data with the recent findings of the Defense Personnel Support Center, Directorate of Medical Materiel Laboratory. Our information indicates that approximately 45% of all preaward samples tested by this agency are rejected for failure to meet National Compendia Standards or DSA specifications.

Shortly afterward the Naval Supply Depot was called upon to support a World War I Navy consisting of 612,840 officers and men and 730 ships. Working long and arduous hours, the performance of the Depot staff was such that recorded history indicates no period during the war when the Navy was handicapped by any lack of medical materiel support. During the war, a new depot was built at Pearl and Sands Streets, Brooklyn, N.Y., which housed the current Field

Branch. From that time, until 1942, the increasing demands of a rapidly expanding Navy upon the Depot necessitated the acquisition of additional storage space in the vicinity of Sands and Pearl Streets, Brooklyn. Funds for additional acquisitions were appropriated in 1943. During these years, therefore, increased storage requirements were met by the expansion of existing facilities, temporary rental of additional facilities, property purchase and new construction.

RADM Kent C. Melhorn, MC, USN, who was then the Commanding Officer of the U.S. Naval Medical Supply Depot, Brooklyn, N.Y., was given the additional title of Chief of the Materiel Division of the Bureau of Medicine and Surgery with additional duty as Medical Officer in Command of the Naval Medical Supply Depot. During the early part of World War II, various Medical Department supply and equipment

functions were scattered among the Planning and Finance Divisions of BUMED and the Naval Supply Depots. Because these Divisions and the Depots apparently failed to recognize or clearly understand the interrelationship between their functions and materiel for the Medical Department, considerable duplication and overlapping resulted. Failure to define parameters of authority and responsibility led to needless confusion and delay. It was evident that a consolidation of all supply functions under one authority would be required to remedy the situation. Following the completion of studies conducted by personnel from the Surgeon General's office and by management engineers, specific recommendations were made for centralization of all planning and policy-making functions concerned with medical logistic support, and a new Materiel Division was established to function as part of BUMED. This new Division was to be located on the premises of the Naval Medical Supply Depot, Brooklyn, N.Y.

The management studies that led to the establishment of the new Materiel Division also laid the groundwork for the present structure of the Field Branch.

Organization

The Field Branch, BUMED and the Materiel Division of the Bureau (Code 42) consist of a Chief, Deputy

Chief and Administrative Assistant. There are five primary branches: Administrative Services Branch, Special Programs Branch, Operating Forces Branch, Materiel Control and Facilities Planning Branch, and a Materiel Evaluation Branch.

The present incumbents are: Chief of the Field Branch, CAPT Solomon C. Pflag, MSC, USN; Deputy Chief, CDR Orlando Stallings, MSC, USN, and; Administrative Assistant, Mr. Edsel Van Leuven. In addition, four Medical Service Corps Officers, 13 enlisted personnel, and 15 civilian employees comprise the staff.

Location

The Field Branch and its analogs, the U. S. Army Medical Materiel Agency and U. S. Air Force Medical Materiel Office, are logically located in close proximity to the Defense Personnel Support Center in Philadelphia, Pa., "where the action is". Daily contact concerning medical materiel matters is thereby facilitated and expedited between the center and the agencies.

Functions

The Field Branch is the Materiel Division of BUMED and is responsible for recommending medical materiel policies to the Chief of the Bureau of Medicine and Surgery via the Assistant Chief of Planning and Logistics (Code 4). It evaluates the effectiveness of the wholesale medical and dental supply system operated by the Defense Personnel Support Center, and the retail medical and dental supply system managed by the Navy Fleet Material Support Office. The Field Branch also acts as a focal point within the naval establishment for all medical and dental supply problems of the operating forces and other medical consumer activities not under the management control of BUMED.

The Field Branch determines the mobilization requirements for medical and dental materiel for the Navy Department; it furnishes these requirements to the Defense Personnel Support Center, concomitant with pertinent data such as the military medical factors considered and any assumptions upon which the stipulated requirements are based.

One of the more important functions of the Field Branch is to develop and maintain allowance lists of medical and dental material for ships, stations, hospitals, Advanced Base Functional Components and Fleet Marine Force organizational units. These allowance lists incorporate professional considerations as well as the latest logistic and management data.

The Field Branch communicates with the Defense Medical Materiel Board via the Navy monitor and recommends the adoption, deletion or modification of items for the Federal Supply Catalog.

In coordination with NAVSHIPSYSKOM and



The Naval Medical Supply Depot at Pearl and Sands Streets in Brooklyn, N.Y., was constructed and commissioned in 1918.

divisions of BUMED, as appropriate, budgetary requirements for medical/dental initial outfitting of vessels, and equipment requirements included in ships alteration plans, are developed. The allotments to cover these programs are administered through Field Branch.

Technical medical/dental equipment lists itemized with estimated costs, are prepared to support military construction plans. These lists include the latest model equipment available and are programmed to reflect the requirements by service.

Field Branch is responsible for the screening and disposition of all excess medical and dental property that cannot be used within fleet/type commands and Naval Districts. Excesses reported to Field Branch from these commands are publicized throughout the Navy. In conjunction with the base closures and major reductions in fleet strengths, the Field Branch has established excess medical/dental material process centers at Naval Supply Centers San Diego, and Norfolk, where ships could off load their entire allowances incident to inactivations. Material at these centers is made available to all activities throughout the Navy. Since establishment of these centers in October 1969, they have processed excess material worth approximately \$1,000,000.

As technical advisor to Headquarters, Naval Facilities Engineering Command, the Field Branch renders technical support to NAVFAC in the design specification, procurement, control and assignments of ambulances, and special types of medical/dental automotive equipment.

Bureau-controlled medical and dental items are technically reviewed by the Field Branch with technical, as well as procurement assistance provided on an "as needed" basis. Each requisition is logistically, technically and professionally evaluated with a view to assisting the requisitioner in obtaining mission-essential equipment of the latest model and design. Each technical review attempts to ascertain that the requested item is suitable for the intended purpose, is the latest model, is a standard item or must be procured on the open market, lends itself to provisioning, and is appropriate for use by ship or shore establishment in terms of power requirements, weight, cube, moment and Bureau acceptability. An essential component of each technical review is a professional review and evaluation conducted in conjunction with appropriate Bureau and/or Naval Hospital Philadelphia staff personnel. The following examples illustrate items and criteria associated with approval and disapproval:

a. Coulter Counters are approved/disapproved on the basis of number of counts being accomplished. A minimum of 30 to 35 counts per day is normally

required for approval, if a counter has a capability in excess of 400 counts in an eight-hour period.

b. Dental X-ray apparatus approved for shipboard must have special friction-grip locking devices for extension arms. Some dental chairs are not approved for shipboard use because of an open reservoir in the hydraulic system.

In summary the primary purpose of a technical review of requisitions is to assist the requiring activity in selecting the latest available, most suitable equipment for mission accomplishment. Each review involves consultation with appropriate professional (medical/dental) personnel. Last year approximately 600 requisitions valued at over \$1,000,000 were technically reviewed, and the necessary procurement support was provided. Additionally, approximately 30,000 requisitions were prepared and processed relative to the initial outfitting and conversion of naval vessels.

In collaboration with the operating forces, research activities, the Defense Personnel Support Center, and the Navy Fleet Material Support Office, the Field Branch continues to develop and participate in the operation of all peacetime and mobilization programs designed to provide medical/dental materiel support to the Navy and Marine Corps.

Approximately six months ago, Field Branch assumed additional responsibility for monitoring the Silver Recovery Program for all BUMED-managed activities. It is anticipated that approximately \$55,000 worth of silver will be recovered annually as a result of this program. Contractors will receive the recovered silver as government-furnished material, in order to reduce the costs of X-ray film and other silver-bearing medical material for all medical activities.

Magnitude of Operations

The Field Branch is responsible for the medical materiel support of approximately 800 ships and 1,400 shore activities to which medical and dental personnel are attached. It is responsible for management with the Navy Fleet Material Support Office Prepositioned War Reserve Requirements comprising \$30,600,000. It is also responsible for furnishing general mobilization requirements for medical/dental materiel to the Defense Personnel Support Center, a program approximating an additional \$21,900,000 in costs.

It annually redistributes excess items worth approximately \$1,000,000 and technically reviews about 600 requisitions, valued at over \$1,000,000, for new material in the Navy medical/dental inventory. The Field Branch is responsible for recommending additions, deletions, and modifications of 13,000 items of medical material. It also prepares about 30,000 requisitions

(Continued on p. 54)

The following article was prepared by CAPT Lay Martin Fox, MC, USN; Chief of Medicine at Naval Hospital, NNMC, Bethesda, Md., and; Chairman of the BUMED Formulary Review Committee. CAPT Fox commented that implementation of the National Academy of Sciences/National Research Council Study on Drug Effectiveness by the Food and Drug Administration has resulted in major changes in the naval approach to procuring and prescribing drug products. These changes have been disseminated through the Navy Directives System. It is important for medical officers to understand the reasons for these changes, and Navy physicians should be apprised of the professional medical guidance and direction involved.

MEDICAL MANAGEMENT OF PRESCRIPTION DRUGS

The Department of Defense (DoD) is engaged in a detailed review of prescription drug management, stimulated by the National Academy of Sciences/National Research Council (NAS/NRC) Study on Drug Effectiveness, and ranging in scope from acquisition to prescription. It is important that members of the Navy Medical Department understand fully both the objectives of the program, and the professional nature of the controls established.

Without adequate and intimate professional medical supervision and guidance, the military medical community would be without confidence in the current efforts. These prerequisites exist in the person of the Assistant Secretary of Defense (Health and Environment), the members of the Defense Medical Materiel Board (DMMB), and the Director of Medical Materiel, Defense Personnel Support Center (DPSC).

Congressional recognition of the importance of high level medical direction for the Armed Forces culminated in elevation of the incumbent physician, Dr. Louis M. Rousselot, to the new position and title of Assistant Secretary of Defense for Health and Environment. Dr. Rousselot had been serving as Deputy Assistant Secretary of Defense (Manpower and Reserve Affairs) for Health Affairs since 2 January 1968.

The single, most important voice of military medicine in the management of medical materiel support is the Defense Medical Materiel Board (DMMB). A tenant of BUMED, DMMB was created by charter from DoD, and is under DoD command. Officially, the Board consists of the Surgeons General of the military services. In practice, each service is represented by a flag or general officer, Medical Corps. The Board staff is headed by a Medical Corps captain or colonel. His assistant director holds that grade in the Dental Corps. Under the direction and immediate supervision of these officers, and with the assistance of the consultants to

the Surgeons General, the Board determines which drug products shall be included in standard stock. Only in the case of sole source procurement (which applies to but six drugs) does the Board designate a product by brand name. Normally the Board describes items in terms of the mandatory performance standards required. These "Essential Characteristics" (EC's) are rigidly designed to protect the quality necessary for worldwide shipment, storage, and use. The EC's are forwarded to DPSC for development of detailed purchase specifications, procurement, and distribution.

The Director of Medical Materiel, DPSC, must be a Medical Corps captain or colonel. His staff of technical personnel convert the EC's to generic specifications with standards equal or superior to those of industry, and invariably higher than those of the Food and Drug Administration (FDA). Table 1 illustrates the successful DMMB/DPSC approach to quality products.

Table 1. Drug Recalls

F.Y.	FDA	DPSC
1968	711	4
1969	707	3
1970	951	1

The lone DPSC recall in F.Y. 1970 reflects the high quality standards of military drug procurement. When originally contracted, quality acceptability was determined by FDA whose test method was based on reducing ten tablets to powder and analyzing the total active ingredients. As a result of complaints from the field, DPSC performed their own standard assay. The active ingredient in each individual tablet was determined, and potency was found to vary from 50% to 150% of the requirement.



The Defense Medical Materiel Board (DMMB) held its 22nd meeting on 20 January 1971. The Chairman, RADM H.S. Etter, MC, USN (center) is flanked by BGEN L.J. Hackett, Jr., MC, USA (left) and BGEN F.A. Heimstra, MC, USAF (right).

Within the overall review now in progress, three specific actions are of immediate interest. A DoD memorandum¹ rescinded or limited authority for procurement or use of certain drugs which are, according to the NAS/NRC Study, of questionable efficacy. Concurrently, DoD has charged a Tri-Service Study Group with an item-by-item analysis of the requirement for every drug product in standard stock. Unilaterally, BUMED has directed a critical reassessment of the drugs listed in each hospital formulary, and is increasing emphasis on the need for vigorous and dynamic Pharmacy and Therapeutic Drug Committees.

The memorandum from DoD relates specifically to drugs rated by the NAS/NRC Study. Other media^{1,2,3} have dealt at length with that subject, and it need be noted here only as a significant part of the program.

The Tri-Service Study Group is a small unit with a broad base of professional support. It is chaired by the Staff Director, Defense Medical Materiel Board (DMMB), and has as members one pharmacist and one

logistician from each Service. The Study Group classifies products by the using medical specialty, and forwards them to the consultants of the three Surgeons General for advice. Recommendations can include proposed actions such as: retain; delete; replace with....; supplement with....; etc.

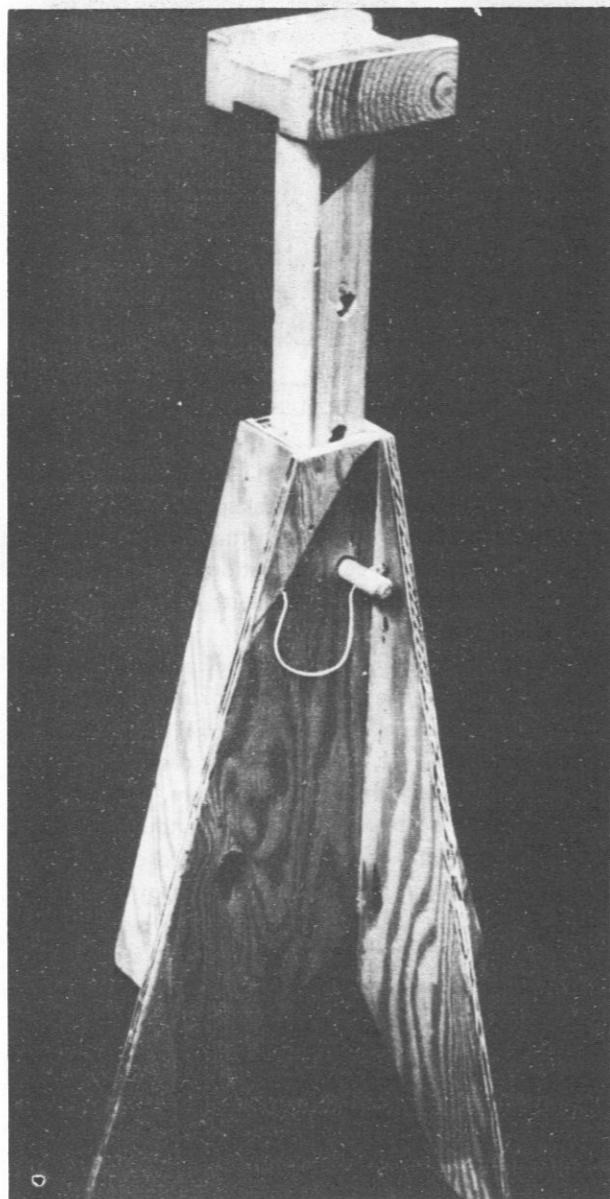
Most significant to the Navy is the review of formularies and the reemphasized mission of the Pharmacy and Therapeutic Drug Committees (P&T)³. As with the standard stock list, it is frequently easier to add items to a formulary than to delete them. Collaterally, it is easier for the P&T Committee to accept a recommendation based on an uncontrolled clinical trial than to require sound, scientific evidence of the superiority of the new and costly over the universally accepted but undramatic existing therapeutic agent. For example, there seem to be few requirements for an agent of the tetracycline family that are not completely satisfied by tetracycline HCl, but a considerable sum is expended annually on molecular modifications of the basic drug. Unquestionably, there may be indications for the other product, but the needs of most patients and the financial position of the command are best served by reserving the costly modifications for their few specific indications.

(Continued on p. 39)

1. Enclosure (1) to BUMEDNOTE 6710 of Feb. 1971, subj: Formulary Notes, 1:1.

2. "Formulary Notes", U.S. Navy Medicine, 57: 1, Jan. 1971, p. 50.

3. Surgeon General's Talking Papers, Edition No. 20, 3 Nov. 1970.



QUADPOD for use with N-K Table in physical therapy.

To the Editor: A stainless steel tripod for use with the N-K Table was described in "U.S. Navy Medicine" in October 1970. The article stated that similar devices could be constructed from less expensive materials. Such a device would be valuable to any physical therapy department that conducts a large volume of quadriceps progressive resistive exercises.

The "quadpod" pictured in the photograph was constructed by a patient from scrap lumber. The quadpod is adjustable to heights of 18, 20, 23, 26, 29 and 33 inches.

LCDR Patsy L. McKelvy, MSC, USN
Physical Therapy Branch
Naval Hospital, San Diego, Calif.

To the Editor: A method of treatment for severe ankle sprains was set forth in a letter to the Editor of JAMA, 214:7, Nov. 16, 1970, p. 1326. The approach appears to have real merit, and if it is as effective as stated by the author, could result in thousands of salvaged man hours annually.

Although I seldom see a sprained ankle in my internal medicine practice, I vividly recall many cases from my days in the emergency room and field. Conservative treatment invariably resulted in a prolonged rehabilitation period, while the application of a short leg cast resulted in such a significant loss of mobility that the patient was virtually removed from duty during the course of treatment.

"U.S. Navy Medicine" could, in my opinion, perform a real service by reprinting this method in a future issue. Thank you.

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(Continued on p. 17)

U.S. Navy Medicine

ABSTRACTS AND REVIEWS

IMPORTED DISEASES

WHO Wkly Epidem Rec 46(7): 57-59,
Feb. 12, 1971.

During 1970, 28 instances of imported disease were reported in the U.S. involving a total of 149 people and eight different diseases, which are briefly summarized below.

Malaria

Thirteen individuals were reported to have suffered from malaria either imported or introduced. An additional seven contracted malaria from blood transfusions which constitute an indirect pathway for introducing malaria into a previously free area. Fourteen of the 20 infections were caused by *Plasmodium falciparum*, five by *P. vivax* and an unidentifiable ring form was detected in the smear of one case. Four tourists, three seamen and three returned servicemen comprised the imported malaria group. Some patients were symptomatic for intervals ranging from four to 10 days before the final diagnosis was made. Symptoms resembled those of infectious hepatitis, gastroenteritis, and even yellow fever. Five of the ten died. All suffered from *P. falciparum* infection, which produced severe hepatic necrosis, cerebral malaria and pulmonary edema. Of the three introduced cases, two were children who had camped in an area near the Mexican border, within the known incubation period of their *P. vivax* infection. The third was a serviceman who had never been out of the U.S. but admitted using heroin intravenously. Contaminated syringes or needles may have been the source of his *P. falciparum* infection. Seven of the 20 reported malaria patients contracted their infection following a blood transfusion. Infected donors were usually traceable. Most had been exposed to malaria either in Vietnam, Korea, or Ghana. The longest interval between exposure and blood donation was 17 years.

Trypanosomiasis

Two instances of imported trypanosomiasis (African sleeping sickness) were recorded. Both were tourists who had traveled extensively either in Kenya or Rwanda. After returning from their safaris, for three and nine days respectively, these patients experienced persistent fever, pain at the site of the insect bite, and neurological abnormalities. In one case an abnormal EKG, hemolytic anemia and an elevated liver enzyme test were detected. Both were treated non-specifically for fever of unknown origin until definitive diagnosis was made by observing the trypanosomes in either

blood or cerebral spinal fluid smears. Both cases recovered successfully after specific treatment.

Filariasis

A 44-year-old Haitian, who had been in the U.S. for seven months, was hospitalized complaining of a testicular hydrocele, thought to be due to trauma. The epididymis was excised and pathological examination revealed *Wuchereria bancrofti*.

Kala-Azar (Leishmaniasis)

A 38-year-old Greek who had left his home country four months previously, experienced generalized fever and malaise for four weeks before admission to a hospital. *Leishmania donovani* were found in smears or biopsies taken from the spleen, liver and abdominal lymph nodes during exploratory abdominal surgery.

Onchocerciasis

A 21-year-old college student who had come four years previously from Ghana, West Africa, presented himself to a hospital with symptoms of impaired vision. Onchocerciasis was diagnosed by identifying the microfilariae in the aqueous humor of the eye and a subcutaneous nodule on the iliac crest.

Giardiasis

Eighty individuals contracted giardia diarrhea whilst traveling in the USSR. Most of the patients who experienced diarrhea, cramps, nausea and anorexia did not become ill until after their return to the U.S. *Giardia lamblia* protozoa were identified in nine stool specimens.

Shigella Dysentery

Three incidents of shigella dysentery acquired abroad were reported during the year. Two occurred in tourists, 64 and 78 years old respectively, who developed bloody diarrhea several days or weeks after returning from Central America. An elderly lady experienced bloody diarrhea for three weeks and was treated variously for amoebic dysentery, ulcerative colitis, or unidentified bacterial diarrhea. After death occurred, probably due to cardiac arrhythmia, *Shigella dysenteriae* type 1 was isolated from ante-mortem blood cultures. The second elderly tourist returning from Mexico was successfully treated, following identification of *Shigella dysenteriae* type 1 in a fecal culture. The third Shigella importation involved 42 persons aboard a tanker traveling from Japan to the U.S. After a stop in Italy, the cook on the tanker became ill. *Shigella sonnei* was later cultured from his stool. Subsequently, 42 other members of the crew suffered a similar diarrhea illness.

Lassa Virus

A 50-year-old laboratory technician experienced

unknown exposure to Lassa virus while working in the laboratory. After causing two unusual deaths in Nigeria, the virus had been brought to the U.S. for study. The illness caused fever, pharyngeal ulcers, pneumonitis, petechial rash, albuminuria, and leukopenia. Autopsy revealed acute fatty metamorphosis of the liver, pneumonia and atypical lymph node hyperplasia. Lassa virus was recovered from autopsy specimens.

These reported events serve to illustrate several important characteristics of such diseases. The infectious agents were primarily parasites and the countries of origin were mainly tropical or sub-tropical. Seamen, tourists and returned servicemen were at greatest risk. However, students, immigrants, laboratory personnel or recipients of blood transfusions were also involved. *The critical problem is the delay in diagnosis.* Proper physician conditioning requires thinking in terms of the possibility of imported disease, and asking the basic question, "Where have you been and when?". A basic knowledge of the geographical distribution of the diseases under consideration is essential. Recognition of the diagnostic possibilities then leads to the correct final diagnosis.

The continual development of national and international surveillance programs is essential if correct diagnosis, treatment and control of imported diseases are to be achieved. The importation of infection in man and animals extends the global distribution pattern of communicable diseases.—Code 72, BUMED. ☞

DIMENSIONAL CHANGES WITH

EQUI-SPANSION* CASTING

Abstract from Research Work Unit: MR005.20-60 by LCDR O.B. Walker, DC, USN, winner of the Naval Dental School Award for Achievement in Research Methods, Class of 1970.

Equi-Spansion is a new casting technique in which a plastic ring is used to invest the pattern and is then removed before burnout. (See Fig. 1) The purpose of this study was to compare dimensional changes in castings made by this technique and by two conventional techniques which require the use of metal casting rings. A Bureau of Standards die was used to construct 20 simulated MOD inlay patterns of Duralay** plastic. Reference lines were scribed on each pattern along four dimensions: the mesiodistal length and

*Surgident LTD, Los Angeles, Calif.

**Reliance Dental Mfg. Co., Chicago, Ill.

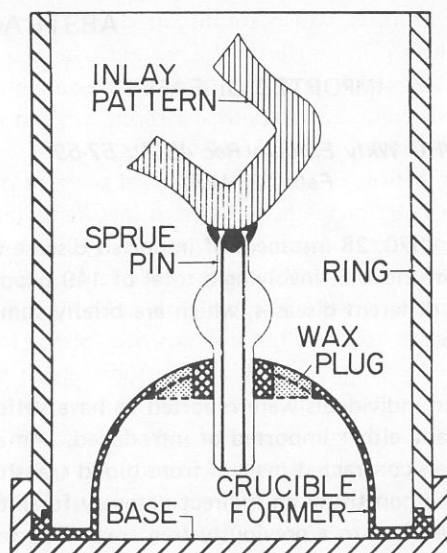


Fig. 1

buccolingual width of the occlusal surface, the mesiodistal width of the gingival floor, and the mesiodistal length of the pulpal floor. Of these patterns, eight were invested by the Equi-Spansion technique, burned out at 900° F, and cast. The remaining 12 were invested in standard 1½-inch metal rings lined with one layer of asbestos; five were burned out at the usual 1,250° F and seven at 900° F before casting. Dimensional changes between corresponding patterns and castings were determined to the nearest 0.01 mm by comparing measurements taken along all reference lines. Both the Equi-Spansion technique and the conventional technique with 1,250° F burnout, produced acceptable castings with little or no dimensional change; the conventional technique with 900° F burnout produced castings with unacceptable dimensional changes. ☞

DROPLET NUCLEI PRODUCED DURING DENTAL TREATMENT OF TUBERCULAR PATIENTS

Roland C. Duell and Richard M. Madden, Univ Ky Col Dent, Lexington, Ky. Oral Surg 30(5): 711-716, Nov 1970.

A potential for infection from a dental patient with active pulmonary tuberculosis exists in the clouds of aerosol mist released when the patient talks and coughs, and particularly when dental procedures incorporating the use of water sprays are performed on the patient. These mists originate in the patient's mouth and contain droplets and droplet nuclei, each of which can carry microbes present in the oral flora.

Unlike the droplets, which are dispersed for short distances in the air and settle to the ground within seconds, droplet nuclei containing viable bacteria are carried by air currents throughout the room and can remain suspended for more than 24 hours.

Calculus, debris, or stain on the labial surfaces of the mandibular anterior teeth of 14 adult inpatients (eight men and six women) with suspected pulmonary tuberculosis, was removed with an ultrasonic scaler. Eight of the 14 patients were infected with pulmonary tuberculosis and had sputum that was positive for the human variety of tubercle bacilli. The Andersen air sampler, Model No. 603, was used to collect airborne particles. The samplers were loaded with Petri dishes containing 27 ml. of Lowenstein-Jensen medium modified with Chloromycetin (0.05 mg./ml.), Acti-Dione (0.50 mg./ml.), and glycerin. Three samplers were positioned in a semicircular configuration, so that the center of the collection-chamber intake was located ten inches from a point between the labio-incisal line angles of the patient's mandibular central incisors. The labial surfaces of the mandibular anterior teeth were cleaned for three minutes, and immediately after the prophylaxis the air was sampled for 15 minutes. Petri dishes were removed and incubated at 37° C and first examined for tubercle bacilli three weeks later. Subsequently, they were examined for seven consecutive weeks. Only after all dishes from a patient had been incubated for 10 weeks were they discarded. A sample for each patient consisted of twelve dishes which were exposed to airborne particles capable of lung penetration. A total of 168 dishes was incubated.

Ninety-six of the 168 incubated dishes represented the tubercular patients. All 96 dishes failed to yield growth of tubercle bacilli. These findings suggest that droplet nuclei containing tubercle bacilli do not result when the teeth of a patient whose sputum is positive for tubercle bacilli are cleaned with an ultrasonic scaler. However, factors associated with the investigation may explain this failure to demonstrate production of droplet nuclei containing tubercle bacilli. The ideal sample in this study would have been the total volume of air in the dental operatory during the scaling of the teeth. This would have allowed for the sampling of most droplet nuclei which were discharged by the patient. Droplet nuclei containing tubercle bacilli can be present in hygienically significant numbers, even when their concentration is well below the range of detection by sampling methods which deal with a few cubic feet of air. Further study should be conducted in a controlled environment which allows for the sampling of all droplet nuclei discharged during the dental procedure.

(Abstract by CAPT George H. Green, DC, USN) 䄀

INCIDENCE OF VIABLE MYCOBACTERIA TUBERCULOSIS ON ALGINATE IMPRESSIONS IN PATIENTS WITH POSITIVE SPUTUM

M. Polan, S. Frommer, and D. Roistacher, J Prost Dent 24(3): 335-338, Sept. 1970.

Cross contamination to the dentist, his assistant or his patients is a continuing danger. Proper sterilization methods would seem to eliminate this threat. Unfortunately, not all dental supplies and materials lend themselves to adequate sterilization technic.

Irreversible hydrocolloid (alginate) is such a substance. Its instability when subjected to heat negates the use of an autoclave and dry heat sterilizer. Syneresis occurs upon immersion, rendering cold sterilization and boiling unacceptable.

Can a hydrocolloid impression be a vector for the transmission of disease?

A review of the literature indicates that sputum is the primary vehicle for the transmission of tuberculosis. A study by the authors was undertaken to see if an impression made in alginate from an infected patient was in fact a vector for the causative organism, *Mycobacterium tuberculosis*.

Twenty male and female maxillary edentulous patients with positive sputum were used for the study. The impression trays were sterilized and the operators gloved. Pre-packaged irreversible hydrocolloid was used. The impressions were made in the morning before any food or liquids were ingested. Each impression was then swabbed in five places and cultures were inoculated by routine laboratory procedures.

The results were significant. Growth appeared in two to four weeks and at the end of the fifth week all cultures were positive.

Comment

Cross contamination is a constant threat to patients and those who work in a dental office. Since *Mycobacterium tuberculosis* was shown to remain viable on the impression surface, might it not also be further transmitted to the models and other materials and equipment in the laboratory? Further study is needed to ascertain if this is true, and if so, how this contamination may be halted.

(Abstract by LT Mark E.J. Heilman, IV, DC, USN) 䄀

SEPTICEMIA FROM INTRAVENOUS INFUSIONS

Richard J. Duma, M.D., John F. Warner, M.D.,
and Harry P. Dalton, Ph.D., *New Eng J Med*
284(5): 257-260, Feb. 4, 1971.

This article reports that a young woman with hepatitis died after developing septicemia due to *Escherichia*. Epidemiological investigations indicated that this infection and previous septicemias were associated with intravenous infusions. Improper techniques in employment of intravenous fluid and infusion-control devices were incriminated.

Prolonged or repeated use of ventilatory and nebulization equipment, or of intravascular or urinary tract catheters is frequently associated with hospital-acquired infections. Nosocomial infection can also be caused by breaks in technique in patient-care procedures, by poor practices in supporting services (laundry, house-keeping, food service) as well as by "classic" person-to-person spread.

We urge Infection Control Committees to demand an effective infection surveillance system, and develop nosocomial infection prevention programs appropriate to their respective hospitals. Area Navy Environmental and Preventive Medicine Units will be glad to assist in any way possible.

Some helpful references include:

(1) *Infection Control in the Hospital*, Revised Edition, American Hospital Association, 840 Lake Shore Drive, Chicago, Ill., 60611.

(2) *Control of Infectious Diseases in General Hospitals*, Franklin H. Top, M.D., Editor, American Public Health Association, 1740 Broadway, New York, N. Y., 10019.

(3) *Isolation Techniques for Use in Hospitals*, U.S. Department of Health, Education and Welfare, Public Health Service, Health Services and Mental Health Administration, National Center for Disease Control, Atlanta, Ga., 30333.

(4) A series of publications in the Hospital and Medical Facilities Series, The Hill-Burton Program, is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The series includes four volumes of "*Environmental Aspects of the Hospital*" as listed below:

a. Volume I, Infection Control, Public Health Service Publication No. 930-C-15, \$.45 per copy.

b. Volume II, Supportive Departments, PHS Publication No. 930-C-16, \$.40 per copy.

c. Volume III, Safety Fundamentals, PHS Publication No. 930-C-17, \$.40 per copy.

d. Volume IV, Administrative Aspects, PHS Publication No. 930-C-18, \$.25 per copy.—Preventive Medicine Division, Code 72, BUMED. ☞

(Continued from p. 31)

Vietnamese physicians and surgeons generally seem to have received little or no specialty training in oral surgery. Dentists in Vietnam are woefully inadequate in number and receive limited training in oral surgery. According to a 1967 World Health Organization survey, the ratio of Vietnamese dentists to population in

South Vietnam is approximately one to 108,000. (The ratio is about one to 2,000 in the U.S.) Navy dental officers in Saigon have recently participated in efforts being made by the Vietnamese dental school there to upgrade its academic program. The specialties of oral surgery and prosthetics have been emphasized. ☞

(Continued from p. 47)

annually for initial outfitting or conversion of naval vessels.

The Navy Medical and Dental Materiel Bulletin

The Navy Medical and Dental Materiel Bulletin is prepared and issued monthly by the Field Branch to promulgate technical and supply information for managing medical and dental material held at Navy and Marine Corps activities, either in the Navy Stock Account or in "End Use" status.

It contains such items as: suspension and reporting of items suspected of being defective, disposition

instructions for suspected/defective medical/dental material, information concerning dated items, newly standardized items, unit prices for newly adopted items and unit price revisions, recall of nonstandard drug items, excess material available for redistribution and miscellaneous information. Over 2,400 copies are made available to ships and stations having medical and dental personnel. Within hospital commands, copies are sent to the following areas: Fiscal and Supply, Pharmacy, Dental, Drug Committee, Chief Professional Services and Infection Committee. Recommendations for improving the usefulness of the Bulletin to the user are invited from the field. ☞



VIRUSES IN DRINKING-WATER

World Health Organization (1970) European Standards for Drinking-water, 2nd edition, Geneva WHO Chronicle 25(1):36, Jan. 1971.

It is theoretically possible for virus disease to be transmitted by water which is free from coliform organisms, but there is no conclusive evidence that this has actually occurred.

None of the accepted sewage treatment methods yields virus-free effluents, but a number of different investigators have found activated sludge treatment to be superior to trickling filters.

Viruses can be isolated from raw water and from springs. Enteroviruses, reoviruses, and adenoviruses have been found in water. Of these, enteroviruses are the most resistant to chlorination. It is considered that if enteroviruses are absent from chlorinated water it can be assumed that the water is safe to drink. There must be some reservation about the virus of infectious hepatitis, since it has not so far been isolated, but in view of the morphology and resistance of enteroviruses it is likely that if they have been inactivated, hepatitis virus will have been inactivated also.

In a water in which there is *free* chlorine, viruses will generally be absent if coliform organisms are absent. However, in a water with a high concentration of organic matter — in which chlorine would not remain as *free* chlorine — absence of coliform organisms would not imply freedom from viruses.— Code 72, BUMED. ☞

MEDICAL LABORATORY CERTIFICATION DEADLINE

Military medical laboratory personnel interested in gaining civilian recognition for their military training

and experience should note that May 1 is the deadline for applying for national certification examinations offered by the Registry of Medical Technologists of the American Society of Clinical Pathologists.

The examinations, to be given at centers throughout the country on July 16, are for Medical Laboratory Technician, MLT (ASCP), and Medical Technologist, MT (ASCP).

Graduates of military medical laboratory training programs totaling at least 12 months are eligible for the MLT (ASCP) examination if they have an associate degree or 60 semester hours of college credit.

The MT (ASCP) examination is open to those who have completed three years of college with 16 hours each in chemistry and biology, one semester in mathematics and a year of clinical education and experience in an AMA-approved Medical Technology Educational Program. This examination is also open to those with a baccalaureate degree with the above required courses plus five years of acceptable clinical laboratory experience.

Applications for the examinations and further information may be obtained from the Registry of Medical Technologists (ASCP), Box 4872, Chicago, Illinois 60680. Applications must be returned to the Registry by May 1, with an application fee of \$25. ☞

DISINFECTANT, FOOD SERVICE

Information has been received from Preventive Medicine Unit No. 2, Norfolk, which indicates a potential storage hazard with Disinfectant, Food Service (Chlorine-Iodine type) FSN 6840-810-6396.

It has been determined that the active ingredient (trichloromelamine) produces heat and gas when exposed to some of the common ingredients of cleaning agents; e.g., ammonia, acetone, M-E-ketone, aniline, and pyridine.

These results have been duplicated and confirmed at other laboratories. Action has been directed to require the following precautionary labeling on each unit, intermediate container, and shipping container:

"CAUTION: DO NOT MIX WITH CLEANING COMPOUNDS OR AMMONIA: mixing with solvents, ammonia, or ammonia-containing cleaners, or ignition by flame or spark will produce heat and smoke."

As a precautionary measure, it is recommended that individual activities review the storage policies of this product and assure that it is not stored with cleaning compounds, organic solvents, or ammonia-containing compounds.—Environmental Health Branch of Preventive Medicine Division, BUMED. ☞

FOOD SERVICE NOTES

LT John E. McNamara III, MSC, USN, Food Service Officer at Naval Hospital Charleston, S.C., has instituted a "Diabetic Clinic" which meets on a Tuesday evening every 4 to 6 weeks. The clinic is designed to supplement the treatment received from medical officers and dietitians, and includes lectures by various members of the staff as well as a discussion session wherein individual problems and questions are discussed by the group. Attendance by members of the patient's family is encouraged. Staff members feel this "group therapy" approach will enable them to more effectively teach newly diagnosed diabetics about their disease and will enhance participation by wives or mothers who frequently play an important role in the management of the disease.

LT Bruce R. Panas, MSC, USN, Food Service Officer at Naval Hospital Memphis, Tenn., has programmed the daily menus through Data Processing. This keeps errors to a minimum and systematically prepares standardized menus. The resulting savings in paper and labor, and improved menu service, are evident.—Code 443, BUMED. ☞

CONTINUING HEALTH-CARE PROFESSIONAL EDUCATION

SecNav Instruction 4651.15B (Subj: Attendance of Medical Department Officers at professional meetings, conferences, seminars, short courses, and symposia) provides an opportunity for Medical Department officers to keep abreast of modern developments and new techniques in their professional fields.

It is desirable that all Medical Department officers stationed in the U.S. be afforded the opportunity to attend one professional health-care conference per year on a temporary additional duty basis. Those

stationed outside the U.S. should have the same opportunity to the extent that location and military operations permit.

This policy also extends to sponsorship for the various excellent home-study or correspondence courses available from numerous civilian institutions, especially when the officer's present duty assignment precludes attendance at conferences.

Financial support for the continuing educational needs of Medical Department officers who are assigned to activities which are not commanded by the Bureau of Medicine and Surgery is centrally managed and provided by the Training and Clinical Services Branch, Professional Division, BUMED.

The commanding officers of most BUMED commanded facilities manage the continuing health-care professional education program locally under the provisions of BUMED Instruction 4651.1. ☞

LTGEN DAVIS TO ASSIST GEN CHAPMAN

LTGEN Raymond G. Davis, USMC, was nominated by President Nixon for promotion to four-star rank and assignment as Assistant Commandant of the Marine Corps. Formerly Commanding General of the Marine Corps Development and Education Command at Quantico, Va., the General succeeds GEN Louis W. Walt who retired 1 Feb. LTGEN Davis was awarded the Medal of Honor for action in Korea while commanding a Marine battalion. A veteran of the Vietnam conflict as well, he holds every other U.S. medal for valor.

LTGEN Keith B. McCutcheon had been previously nominated for the position, but illness precluded his succession to the post.—Washington (AFPS). ☞

MEDICAL CORPS ART EXHIBIT

In commemoration of the 100th anniversary of the Navy Medical Corps, an exhibit of 30 selected paintings from the Navy Combat Art Collection depicting the Navy Medical Corps in action from 1941 to the present, will be on exhibit through 31 May 1971, at the National Library of Medicine, 8600 Rockville Pike, Bethesda, Md. The art show is open to the public Monday through Friday from 8:30 a.m. to 9 p.m. (Saturday from 8:30 a.m. to 5 p.m.).

The Navy Combat Art Collection is one of the world's outstanding collections of war-related art. Begun in 1941, it is considered a national treasure. The collection now consists of more than 4,000 paintings, sketches and other graphic forms, depicting the U.S. Navy at the frontiers of science as well as the frontiers

of war. The collection is permanently housed in the U.S. Navy Combat Art Gallery, Navy Yard, Washington, D.C., where portions of it are always on display.

This special exhibit is made possible through the cooperation of the National Library of Medicine and the Navy, Marine Corps Exhibits Center in the Washington Navy Yard. The exhibit is sponsored by the Navy Bureau of Medicine and Surgery.—PAO, NNMC, Bethesda, Md. 🍀

NAVY COMMAND AND STAFF SEMINAR

A Command and Staff Seminar for recently selected Captains of the Navy Medical Corps was held at the Airlie Conference Center, Warrenton, Va., from March 1-5, 1971. The Seminar was sponsored by BUMED and presented by the Naval Medical School and the Naval School of Health Care Administration, under the commands of RADM C.L. Waite, MC, USN, and CAPT R.M. Tennille, Jr., MSC, USN, respectively. Course director was CAPT D.H. Gaylor, MC, USN, Chief of Schools and Continuing Education Service, and Acting Executive Officer of the Naval Medical School.

One hundred and ten Captain selectees from naval hospitals and Staff Commands throughout the world heard the subjects of leadership and senior management discussed. RADM David H. Bagley, USN, of the Bureau of Naval Personnel presented a talk on "Challenges to the Navy of the Seventies". Leaders of the Bureau of Medicine and Surgery, including the Surgeon General, VADM George M. Davis and the Deputy Surgeon General, RADM John W. Albright, related the problems, solutions and goals of the Medical Department in the delivery of health care.

A major part of the Seminar relating to management was presented by the faculty of the Naval School of Health Care Administration.

At the conclusion of the Seminar many of the selectees departed for Washington, D.C., where they attended the Centennial Ball of the Medical Corps at the Statler Hilton Hotel.—PAO, NNMC, Bethesda, Md. 🍀

HM3 BAUGHMAN REENLISTS

HM3 Dennis D. Baughman, USN, of Youngwood, Pa., added another four years to his naval career. He is presently assigned to the Radiation Safety Department of the National Naval Medical Center and will enter Radiation Therapy School, Naval Medical School, at the Medical Center in April. Upon successful completion of the six-month course, he will be assigned to one of seven naval hospitals which have radiation therapy departments.



RADM Ballenger, CO NNMC, left, witnesses signing of reenlistment papers by HM3 Baughman.

In his brief naval career, HM3 Baughman has already served a tour of duty with the First Marine Division in An Hoa, Vietnam. He has earned numerous medals and awards, including the Purple Heart, the Bronze Star with Combat V, and the Vietnam Cross of Gallantry.

Witnessing the event is RADM F.P. Ballenger, MC, USN, Commanding Officer, NNMC.—PAO, NNMC, Bethesda, Md. 🍀

BIOMEDICAL CONFERENCE

Grossmont College, El Cajon, Calif., will co-sponsor and serve as host at the third National Conference on Biomedical Technology and Manpower. Other sponsors of the spring conference will be: the Naval Hospital Corps School, San Diego; the American Association of Junior Colleges in cooperation with the Regional Medical Program for San Diego and Imperial Counties, and; the University of California, San Diego, School of Medicine. Scheduled for April 5, 6 and 7, 1971, at Grossmont College, the Conference will accent San Diego area programs now in progress, particularly those involving curricular development, staffing and recruitment of personnel.

The spring conference will feature outstanding leaders in both the field of medicine and education. Already scheduled for leadership roles are: Kenneth Skaggs representing the American Association of Junior Colleges; Dr. Doris Meek, San Diego State College; Dr. Louis Batmale, Vice President of San Francisco City College; C. Allen Paul, Dean of Technical-Vocational Education, Grossmont College; Willard E. Dellegar, Head, Biomedical Technology Program, Grossmont College, and; Assemblyman Gordon Duffy, Sacramento.

Representing the medical profession at the conference will be: Dr. Michael B. Shimkin, University of California, San Diego, School of Medicine and Director of the Regional Medical Program in San Diego and Imperial Counties; Dr. Norman Shumway, Stanford

University School of Medicine; Captain Richard Smith, U.S. Public Health Service and the University of Washington School of Medicine, and; CAPT Russell E. Hunter, MSC, USN, Naval Hospital Corps School, San Diego, Calif. ☸

LAST VIETNAM CASUALTY AT YOKOSUKA HOSPITAL

1st/LT Francis M. Brosnam, USA, received a \$25 Savings Bond from Mrs. U.S. Savings Bonds, Jeanie Smith. LT Brosnam was honored for being the last Vietnam battle-casualty patient at the naval hospital which ceased receiving Vietnam casualty patients on

1 Jan. Mrs. Smith toured Japan under the auspices of the U. S. Treasury Department. Also present during the Feb 22 ceremony was Hospital Commanding Officer CAPT Philip O. Geib, MC, USN.—PAO, Commander US NAVFOR, Japan.



1st/LT Brosnam, USA accepts Savings Bond from Mrs. Smith as CAPT P.O. Geib, MC, USN, CO, looks on. ☸

SOCIETY OF AIR FORCE CLINICAL SURGEONS

The 19th Annual Symposium of the Society of Air Force Clinical Surgeons will be held at the San Antonio Convention Center, San Antonio, Texas, 23-25 May 1971. Navy surgeons planning to attend are requested to obtain preregistration forms as soon as possible. This information is needed in order to arrange for hotel reservations.

Preregistration forms may be obtained by writing

directly to COL Robert G. Dawson, USAF, MC; Box 368884, Wilford Hall USAF Medical Center; Lackland AFB, Texas 78236. ☸

AMA MEETING

The annual meeting of the American Medical Association to be held in Atlantic City, New Jersey, June 20-24, 1971 has been approved for Naval Reserve retirement point credit.

Naval Reserve Medical Department officers may certify the dates they attended directly to the Officer-In-Charge, Naval Officer Record Support Activity, Naval Personnel Center, 30th and Fort Streets, Omaha, Nebraska 68111. ☞

MIT COURSE

Massachusetts Institute of Technology will offer, July 12-23, 1971, an elementary course titled *Design and Analysis of Scientific Experiments*. This two-week summer program is for persons interested in the planning, analysis, and evaluation of economical and effective experiments in the physical, chemical, biological, medical, engineering or industrial sciences. Further particulars may be obtained by writing to the Director of the Summer Session, Room E19-356, Massachusetts Institute of Technology, Cambridge, Mass. 02139. ☞

INTERNATIONAL ELECTROMYOGRAPHY CONGRESS

The Fourth International Congress of Electromyography is sponsored by the International Federation of Societies for EEG and clinical neurophysiology. The meeting will be held in Brussels, Belgium on 12-15 September 1971. Prof. John E. Desmedt will be the president of the congress which forms part of a quadrennial series (previous EMG congresses in Pavia, Copenhagen and Glasgow).

Five symposia will be held during the Brussels congress:

1. *New concepts of the motor unit*
2. *Intracellular electromyography*
3. *Pathological conduction in nerve fibres*
4. *Electromyography in biomechanical studies*
5. *Human reflexes and motor mechanisms (I and II).*

Voluntary communications will also be programmed and a practical EMG course will be organized on September 16th.

For further information, write to the Secretary: Dr. K. Hainaut, Brain Research Unit, 115, boulevard de Waterloo - Brussels 1000, Belgium. ☞

NAVMED SCHOOL FILMS

1. "The Decision is Yours" (MN-10198-B) 16 mm color, 29 minutes, received an outstanding film award from the Annual Meeting of the Association of Military Surgeons. This film presents factual information through a series of interrelated dramatic vignettes on the importance of exercising self-control in matters of

sex, drinking, drug use, and smoking.

2. "Trip to Where" (MN-10494) 16 mm color, 49 minutes, has recently won the unique honor of being the most widely used film distributed by the Department of the Navy. It discusses the physical and psychological effects of three groups of drugs: the amphetamines, the barbiturates, and hallucinogens. Special emphasis is placed upon the potentially dangerous effects on an individual's performance in critical operations.

3. "Down the Hatch" (MN-10689) 16 mm color, 44 minutes, presents the effects of alcohol on character, personality, behavior and ultimately on individual performance.

4. Two interesting films concerning electrical hazards recently made available are: "Electrical Hazards in the Hospital" (H-A-PMB-018), and "Electrical Hazards in the Operating Room" (H-A-PMB-019), written by LT Francis Paul, MC, USN, NavHosp Portsmouth, Va.

5. Requests to borrow these films on a short term basis may be addressed to: Medical Film Library, Naval Medical School, NNMC, Bethesda, Md. 20014. ☞

REQUEST FOR JOURNALS

The Naval Dental School needs issues of the Journal of Prosthetic Dentistry from the time it was published up to the present. If anyone has any of these issues he would be willing to donate to the School, please mail them to the Commanding Officer (Code E4), Naval Dental School, National Naval Medical Center, Bethesda, Md. 20014. ☞

AMSUS AWARDS

The Association of Military Surgeons of the U.S., in the January issue of their journal, *MILITARY MEDICINE*, outlined the various awards for which proposed candidates must be nominated by 15 June 1971. All readers are urged to participate. In addition to the Major Louis Livingston Seaman Award for the most notable article published in *MILITARY MEDICINE* during the previous calendar year, there are three available essay awards for essays submitted under a *nom de plume*: The Henry S. Wellcome Medal and Prize, the Federal Nursing Service Award, and the Federal Medical Services Residents Award. The additional awards and honors offered by AMSUS are listed below.

Nominations for 1971 awards recipients are currently being considered by all Commanders and Directors of Federal Medical Facilities. Nominations must be received by the Awards Committee, Association of Military Surgeons, postmarked not later than 15 June 1971.

AWARD TITLE	SPONSOR	ACHIEVEMENT RECOGNIZED	PRIZE
The John Shaw Billings Award	Eaton Laboratories Div., Norwich Pharmacal Co.	AMSUS member under 41 for outstanding potential in Executive Medicine.	Plaque; \$500.
Joel T. Boone Award	Executive Council, AMSUS	Outstanding Service to the Association.	Bronze plaque and Life membership.
The Andrew Craigie Award	Lederle Laboratories Div., American Cyanamid Co.	Outstanding accomplishment in advancement of professional pharmacy within the Federal government.	Silver plaque; \$500.
The Founder's Medal	Executive Council, AMSUS	Outstanding contribution to military medicine and meritorious service to the Association.	Bronze medal; Scroll; Life membership.
Casimir Funk Award	USV Pharmaceutical Corporation	Outstanding accomplishment in the field of Cardiovascular disease by person eligible for AMSUS membership.	Scroll; \$500.
The Gorgas Medal	Wyeth Laboratories of Philadelphia	Distinguished work in preventive medicine.	Silver medal; Scroll; \$500.
The Philip Hench Award	Merck, Sharp & Dohme	Outstanding contributions in field of rheumatology and arthritis.	Bronze plaque; \$1000.
The Margetis Award	Astra Pharmaceutical Products, Inc.	Outstanding contribution to dentistry by a practicing federal dental services clinician eligible for AMSUS membership.	Plaque; \$500.
The McLester Award	Lederle Laboratories Div., American Cyanamid Co.	AMSUS member for outstanding work in nutrition and dietetics.	Bronze plaque; \$500.
The William C. Porter Lecture	Geigy Pharmaceuticals, Div., Geigy Chemical Corp.	William C. Porter Lecture, on psychiatry at Annual Meeting.	Scroll; \$500; Expenses.
The Stitt Award	The National Drug Company	AMSUS member for some notable work in medicine.	Bronze plaque; \$500; Life membership.
The Sustaining Membership Lecture	Sustaining Members, AMSUS	For outstanding contribution in the field of health care, at Annual meeting.	Scroll; \$500.
The James Clarke White Award	Eli Lilly and Company	AMSUS member for outstanding work in clinical or research dermatology.	Bronze plaque; \$500.
The MAJ Gary Wratten Award	Garrett Corporation	Outstanding accomplishment in field military medicine by person eligible for AMSUS membership.	Bronze plaque; \$500.

OFFICIAL INSTRUCTIONS AND DIRECTIVES

FM CNO (Z-70) to NAVOP *Grooming and Uniform Policy*

1. As a result of my recent field trips and personal contacts with Navymen, plus the high incidence of correspondence, it is clear to me that further amplification of and change to policy is required in two areas covered in NAVOP Z-57, namely hair grooming and uniforms. These changes will be incorporated in the next change to U.S. Navy Uniform Regulations.

a. Hair grooming: The Navy does not prescribe nor distinguish among styles of haircuts. A wide variety of hair styles, if maintained in a neat manner, is acceptable. The determination of hair styles, within the criteria detailed below, is an individual decision.

(1) Hair will be neat, clean, trimmed, and present a groomed appearance. Hair will not touch the collar except for the closely cut hair at the back of the neck and that will present a tapered appearance. Hair in front will be groomed so that it does not fall

below the eyebrows when a person is uncovered and it will not bush out below the band of properly worn headgear. In no case shall the bulk or length of hair interfere with the proper wearing of any military headgear. The exact maximum length of the hair is no longer specified.

(2) If an individual chooses to wear sideburns, they will be neatly trimmed. Sideburns will not extend below the bottom of the earlobe, will be of even width (not flared), and will end with a clean-shaven horizontal line.

(3) If a beard or moustache is worn, it shall be well groomed and neatly trimmed in order not to contribute to a ragged appearance. This policy authorizes and includes full and partial beards, Vandykes, and goatees.

b. Uniforms: In addition to the foregoing policies associated with grooming I believe that some discussion of uniforms is needed.

(1) I see nothing wrong with the wearing of the

blue working jacket, raincoat, or peacoat with the dungaree working uniform. However, I want to emphasize that this uniform is only to be worn between work and the local residence. Foul weather or flight jackets are not appropriately worn off base with the working uniform. Flight jackets may, however, be worn with flight suits wherever they are appropriately worn.

(2) Although the wearing of working uniform to and from work and the local residence has been authorized, it is not intended that personnel be permitted to make other than very brief stops off base for personal necessities in this uniform. The working uniform remains a working uniform, not a liberty uniform.

2. I wish to reemphasize that within the broad guidelines of the policies I have issued and amplified, it remains the responsibility of officers in command to ensure that their personnel present a neat and well groomed appearance at all times in all places.

3. None of my recent directives have lowered our Navy standards of grooming and dress; they have, however, represented changes in standards to reflect contemporary styles and trends. I ask for the continued support of all hands to demonstrate maturity and good judgment in shouldering the individual responsibility necessary to preserve the fine appearance of a man in uniform. I expect responsible officers and petty officers to take in hand those few individuals who are not willing to accept the spirit of these special privileges. 🍀

MANUAL OF THE MEDICAL DEPARTMENT

Change 61, 8 December 1970

a. On page 6-39 corrects the section number (XVI vice VI) at top of page.

b. For article 6-150, Dental Service Report, modifies (2) on "Who Submits" and (4) on "EAM Code Number."

c. Deletes 16-20 (4) to eliminate special Health Record custody instructions for officers ordered to the Navy Department for duty.

d. In 18-13 and 18-21 substitutes references to the International Classification of Diseases for the superseded portions of the DoD Disease and Injury Codes.

e. To 18-21, item 13, adds a subarticle (3) to provide Medical Board Report instructions for EPTE diagnoses.

f. Modifies 18-21 item 23 (1) and 18-22 and adds 18-22A on medical board procedures for processing members through the new disability retirement system.

g. Revises 20-7, Navy Laboratory Funds (Independent Research).

h. Expands 20-9 (2) to insure recognition of accredited laboratory animal care facilities.

Change 62, 27 January 1971

a. In 16-3 (1), 16-5 (4), 16-6 (2) (b) and (f), 16-14 (2) and (3), and 16-26, implements BUMEDNOTE 6150 of 20 January 1971 by changing the procedures for the disposition of health and dental records of active duty members released to inactive duty.

b. Changes 16-9 (3) and 16-57 to eliminate termination and closing entries on the SF 600 and reduce details of such entries on the NAVMED 6150/4.

c. Amplifies 16-9 (4) to insure that dental and sick-call records are included in the records sent to BUMED upon termination or closure of Health Records.

d. Revises 16-12 (1) so that for discharge-and-immediate-reenlistment cases all Health Records will be retained in the members field Health Record, except for the original of the reenlistment SF 88.

e. Adds 16-12 (2) for proper terminating entries and timely disposition of death records.

f. Amplifies 16-27 (3) to standardize the method of sending to BUMED records of members whose present duty station, status, or location cannot be determined. 🍀

BUMED INSTRUCTION 1520.16 of 21 DEC 1970

Subj: Inservice Residency Sabbatical Program; implementation procedures for

Establishes a program which offers as an incentive to outstanding senior residents the opportunity to visit a training institution of their choosing under Navy sponsorship. Eligibility is limited to Inservice Residency Training Programs which are of three or more years in duration. TAD to a university, medical center, clinic, or institution of higher learning located in the U.S. will not exceed two weeks in duration. The individual with whom the resident will be associated during this period must be a renowned expert or authority within his particular field or specialty. Letters of application should reach the Bureau at least eight weeks prior to the desired period of TAD. BUMED INSTRUCTION 1520.17 of 8 March 1971 establishes a similar program for Dental Corps Officers. 🍀

BUMED NOTICE 5430 of 23 FEB 1971

Subj: BUPERS Liaison Office in BUMED For All Enlisted Matters; establishment of

On 1 February 1971, enlisted detailing was relocated in BUPERS as a separate Rating Control Unit. This

change was implemented to consolidate all detailing prior to centralized enlisted assignments by BUPERS. The liaison office is responsible for coordinating all enlisted rating control matters pertaining to personnel assignments and selection for training; maintain and control BUMED command staffing levels by technical specialty; plan, organize and administer inservice, out-service, and technical training programs. BUMED Code 342 is the BUPERS liaison office. All matters pertaining to Dental Technicians will be handled by BUMED Code 6A. ☞

MEMORANDUM

*Subj: Military Standby and
Reservation Air Fares*

Reports have been received from airlines of an upsurge in recent weeks of military personnel requesting reduced standby and reservation fares without the required DD Form 1580 in their possession. Recent changes to service policies by which formal orders for weekend leave are no longer required, may tend to increase this problem. DD Form 1580 is a mandatory requisite for military personnel desiring to avail themselves of reduced air fares for leave travel. Requirement is a provision of carrier tariffs which have the full force and effect of law. Lacking the DD Form 1580, airline personnel have no alternative but to collect the full fare. ☞

✠ In Memoriam ✠

CAPT James B. Butler, MC, USN (Ret) died on 11 March 1971 at the Naval Hospital, Philadelphia, Pa. He was born on 28 July 1908 in Swedesboro, N. J. In 1927 he graduated from Hahnemann College of Science, Philadelphia, and in 1931 received the degree of Doctor of Medicine from Hahnemann Medical College. Dr. Butler was appointed a LT(jg), MC, USN, on 8 June 1931 and interned at the Naval Hospital, Philadelphia. In December 1938 he reported as Medical Officer of the USS Sacramento which assisted in the rescue work following the SQUALUS disaster. In September 1939 he was detached from the SACRAMENTO (the last coal burning vessel in the U.S. Navy) following her final cruise. Throughout WW II CAPT Butler was attached to the Planning Division, BUMED, and for outstanding performance of duty, he received a Letter of Commendation with authorization to wear the Commendation Ribbon, from the Secretary of the

Navy. In May 1948 CAPT Butler reported as Senior Medical Officer on the staff of Commander Fleet Activities, Yokosuka, Japan, with additional duty as Staff Medical Officer, Commander Naval Forces, Far East. Upon the commissioning of the Naval Hospital, Yokosuka, he became the first commanding officer of that activity. He was awarded the Bronze Star Medal for meritorious service as Force Medical Officer. In September 1951 he became Director of the Planning Division, BUMED, and in July 1956 was ordered to duty at the Naval Hospital Great Lakes, where he subsequently became the Commanding Officer in Sept. 1956. CAPT Butler retired in July 1961.

CAPT Charles R. Moon, MC, USN (Ret) died on 16 December 1970 at the Naval Hospital San Diego, Calif., due to *rupture of cardiac chordae*. Born in Murfreesboro, Arkansas, on 5 June 1900, he enlisted in the U.S. Navy in June 1918 and was honorably discharged in February 1919. He received the B.S. degree from the University of Arkansas in 1922 and the Doctor of Medicine degree from the University of Arkansas School of Medicine in 1926. He interned at St. Vincent's Infirmary in Little Rock and subsequently practiced in that city. In 1931 he was commissioned LT(jg), MC, USN and was assigned to the staff at the Naval Hospital Great Lakes. CAPT Moon served as Medical Officer of the USS Raleigh while that ship was engaged in the evacuation of refugees from Spain during the Civil War there. He was serving as Medical Officer aboard the aircraft carrier USS Enterprise when the U.S. entered WW II in December 1941. He participated in all the actions during the first year of the war and received a Letter of Commendation with Ribbon and Combat "V" from the Commander in Chief, U.S. Pacific Fleet and was entitled to the Ribbon for, and a facsimile of, the Presidential Unit Citation awarded the ENTERPRISE. He later served as Executive Officer of the following naval hospitals: Farragut, Idaho; Yokosuka, Japan; and Guam, M.I. In April 1950 CAPT Moon assumed duties as Head of the Surgery Branch, Professional Division, BUMED. He was Commanding Officer of the Naval Hospital Bremerton, Wash., from April 1957 to July 1959. From August 1959 until his retirement on 1 July 1962, he was Assistant District Medical Officer for COMELEVEN. CAPT Moon was a member of the American Medical Association, and a Fellow of the American College of Surgeons. He is survived by his widow, Marjorie.

CAPT William Leslie Roberts, MC, USN (Ret) died 5 March 1971 at the Naval Hospital Camp Pendleton. Death was due to respiratory failure following

complications of emphysema. CAPT Roberts was born on 8 February 1908 at Philadelphia, Pa. He received his B.A. degree from Amherst College in 1930 and Doctor of Medicine from the University of Pennsylvania Medical School in 1934. Dr. Roberts interned at Germantown Hospital, Philadelphia. In April 1942, he was commissioned LT, MC, USNR and was assigned duties of Assistant Radiologist, NTS, Newport, R.I. During WW II CAPT Roberts participated in the last amphibious landing on Kume Shina. He was released from active duty in February 1947. Having returned to active duty in November 1947, he was selected for reintegration into regular service in January 1948 and was appointed CDR, USN to date from 5 November 1945. Dr. Roberts was promoted to CAPT in October

1955. His name was placed on the retired list in September 1965. He is survived by his widow and one son.

CAPT Dale B. Watkins, II, MC, USN (Ret) died on 7 February 1971 in Honolulu. He was born on 9 June 1914 in Chinook, Montana. He received his Doctor of Medicine from the University of Minnesota in 1942 and was commissioned ENS, MC, USN in October 1942. During WW II CAPT Watkins served on the staff at naval hospitals in California, Guam and Okinawa. In 1964 while serving as the Chief of Dermatology at Naval Hospital Key West, Fla., his name was placed upon the TDRL list. CAPT Watkins is survived by his wife, two daughters and one son. ☙

COUNTY STUDENTS HEAR NNMC EXPERTS



Montgomery County High School students quiz CDR Albert Price, MC, right, and LCDR Victor Vieweg, MC, left, following science-oriented lectures by the two doctors at the National Naval Medical Center in Bethesda. CAPT William Baker, MC, of the Naval Hospital at the Medical Center and other members of the Cardiology staff at the Hospital also gave lectures to the students. CAPT Baker has been in charge of the Medical Center's portion of the annual program for four years. These are students among over 300 county students participating in a

Student Research Fellowship Program. Students in the program attend two days of lectures at the Naval Medical Center and two days at the National Institutes of Health. The students then attend a fifth meeting to take a competitive examination based on the material presented in the lectures. The 12 highest-scoring students are awarded a stipend from the Montgomery County Heart Association; they are given the opportunity to assist research scientists at the Naval Medical Center or at NIH for seven weeks during the summer.—PAO, NNMC, Bethesda, Md. ☙

RADM B. TENNEY, JR., MC, USNR (RET) HONORED

On 5 January 1971, RADM Benjamin Tenney, Jr., MC, USNR (Ret) was awarded the Legion of Merit. The award was presented by CAPT Arthur R. Errion, MC, USN, Commanding Officer at Naval Hospital Boston, Chelsea, Mass. The ceremony was attended by: hospital officials; CAPT Robert K. Barton, MC, USN, Director of Professional Division, BUMED; and friends and associates of RADM Tenney.

As a consultant to the Naval Hospital Boston, RADM Tenney rendered invaluable service to the Navy by providing medical knowledge and professional inspiration for hundreds of physicians and paramedical personnel.

The citation was awarded for "exceptional meritorious service during the period October 1950 to September 1970 as a consultant to the Surgeon General of the Navy in the specialty of Obstetrics and Gynecology."

In addition to occupying the positions of Clinic Professor of Obstetrics and Gynecology at Harvard Medical School, and Director of the Department of Obstetrics and Gynecology at the Boston City Hospital, RADM Tenney gave unstintingly of his time and professional ability in the field of medical education and training within the Navy Medical Department.—PAO, Nav Hosp Boston, Chelsea, Mass.



(From left to right): CAPT A. R. Errion, MC, USN, CO Nav Hosp Boston; RADM and Mrs. Tenney, and; CAPT R. K. Barton, MC, USN. 🇺🇸

FEDERAL MEDICAL SERVICES

RESIDENTS AWARD

The Association of Military Surgeons of the U. S. will present the Federal Medical Services Residents Award for the first time at the 78th Annual Meeting of the Association to be held Dec. 5-8, 1971, at the Washington Hilton Hotel, Washington, D.C.

The newly created award, initiated by the Purdue Frederick Company, consists of a scroll and honorarium of \$500. Competition is open to any federal medical resident, at any level in the Federal Medical Services, who submits an essay reporting on a beneficial study of, or contribution to, federal medicine in any medical area of federal medical practice. The essay cannot have been previously published and may represent the result of a study, or actual experience, or both. 🇺🇸

United States Navy Medicine

CORRESPONDENCE AND CONTRIBUTIONS from the field are welcomed and will be published as space permits, subject to editing and possible abridgment. All material should be submitted to the Editor, U.S. Navy Medicine, Code 18, Bureau of Medicine and Surgery, Washington, D.C. 20390

NOTICES should be received not later than the third day of the month preceding the month of publication.

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☆U.S. GOVERNMENT PRINTING OFFICE: 1971—434-363/8